

## SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Mik Uhlir Examiner #: 79025 Date: 9/5/02  
 Art Unit: 1773 Phone Number 305-8179 Serial Number: 09/816548  
 Mail Box and Bldg/Room Location: 11A03, CP3 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

\*\*\*\*\*  
 Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Magnetic recording medium & manufacturing method therefor

Inventors (please provide full names): Hiroyuki Ohmori

Earliest Priority Filing Date: 3/31/00 2000- 10/350-JP

\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

US 20010036564 A1

(1) A magnetic recording medium comprising  
 - a non-magnetic substrate

- a non-magnetic layer comprising ~~wherein~~ Ru alloyed with ~~the~~ <sup>Al</sup> wherein the alloy has >80% Ru.

+ Ti/Al<sub>2</sub>/I<sub>3</sub> (or or Pt, Pt, Y, C) ~~the~~ <sup>Al</sup> ~~wherein~~ the alloy has >80% Ru.  
 + a magnetic layer on the non-magnetic Ru Alloy  
 Carbon layer

(2) A magnetic recording medium comprising

- Substrate synt

- an underlayer containing >20 at. % Ru.

- a plurality of magnetic layers on the underlayer wherein the magnetic layers are separated by

an alloy layer comprising Ru Alloyed with

one of Al, Ti, Y, C, Fe, Mn, <sup>(B)</sup> W, Cu, Y, Zr, Nb, Mo, Rh, Pd, Ag, Hf, Ta

W, Ir, <sup>(Pt)</sup> Al, Si, B, and C, and further contains an oxide carbide or nitride of Si, Al, Ti, B, and Ta.

A3/A4

+

C

## STAFF USE ONLY

## Type of Search

## Vendors and cost where applicable

Searcher: John Calve NA Sequence (#) STN ☒  
 Searcher Phone #: 812/102 AA Sequence (#) Dialog  
 Searcher Location: 8/12/02 Structure (#) Questel/Orbit  
 Date Searcher Picked Up: 9/13/02 Bibliographic ☒ Dr. Link  
 Date Completed: 3-4 hrs Litigation Lexis/Nexis  
 Searcher Prep & Review Time: 2-3 hrs Fulltext Sequence Systems  
 Clerical Prep Time: 2-3 hrs Patent Family WWW/Internet  
 Online Time: 2-3 hrs Other Other (specify)

=> d his nofile

Nik,

I ran your results in the learning file LCA first. After obtaining results in the learning file, you need to search in the full file HCAPLUS ( L25 - L87).

I tried to organize your results by amount of Ru. L8 are the register numbers for Ru alloys, with any amount of Ru (0.1 etc.). L9 has > 20% Ru and L10 >75%. I also arranged your results in this order, L82 corresponds to L10, L83 to L9, and L87 to L8. The registry numbers that are highlighted should correspond approximately to the amt. of Ru.

L93 contains the oxides/nitrides or carbides (L37 or L38).

By the way, when you hand in a search it is better for us if you give us a copy of the claims. It will also save you a lot of time, since you will not have to write anything on the search form. Thanks.

FILE 'REGISTRY' ENTERED AT 08:20:13 ON 13 SEP 2002

L6	111212	SEA ABB=ON	PLU=ON	RU/EL5
L7	733618	SEA ABB=ON	PLU=ON	AYS/CI (ays = alloy)
L8	6103	SEA ABB=ON	PLU=ON	L1 AND L2 *** all alloys w/ Ru)
L9	1556	SEA ABB=ON	PLU=ON	L3 AND >20 RU/MAC ****
L10	370	SEA ABB=ON	PLU=ON	L3 AND >75 RU/MAC ****

FILE 'LCA' ENTERED AT 08:20:47 ON 13 SEP 2002

				D COST
L11	2559	SEA ABB=ON	PLU=ON	MAGNET?
L12	2989	SEA ABB=ON	PLU=ON	(TAPE? OR DISK? OR RECORD?(2A) (MATERIAL?) OR SUBSTANCE? OR CORE?) DISC#
L13	456	SEA ABB=ON	PLU=ON	TAPE? OR DISK? OR DISKETTE? OR COMPACT(W) (D ISK? OR DISC?) OR VIDEO# OR STORAGE?(W) (MEDIA? OR MEDIUM? OR SUBSTANCE? OR MATERIAL?) OR HARD(W)DRIVE? OR DASD?
L14	51	SEA ABB=ON	PLU=ON	UNMAGNETIC? OR NONMAGNETIC OR MAGNET?(2A) (U N OR NON)
L15	6034	SEA ABB=ON	PLU=ON	FILM? OR THINFILM? OR ULTRATHIN(W)FILM? OR COAT? OR LAYER? OR OVERLAY? OR OVERLAID? OR TOPCOAT? OR OVERCOAT?
L16	562	SEA ABB=ON	PLU=ON	MULTILAYER? OR MULTIFILM? OR MULTICOAT? OR MULTI(2A) (COAT? OR LAYER? OR FILM?) OR LAMEL? OR LAMIN?
L17	10092	SEA ABB=ON	PLU=ON	SUBSTRAT? OR SURFACE? OR BASE# OR SUBSTRUCT ? OR UNDERSTRUCT? OR UNDERLAY? OR FOUNDATION?
L18	91	SEA ABB=ON	PLU=ON	COERCIV?
L19	3	SEA ABB=ON	PLU=ON	(SIGNAL(W)NOISE# OR S/N) (2A)RATIO?
L20	42	SEA ABB=ON	PLU=ON	S(W)N
L21	3	SEA ABB=ON	PLU=ON	L20(2A)RATIO?
L22	5	SEA ABB=ON	PLU=ON	L21 OR L19
L23	821	SEA ABB=ON		(SILICON OR SI OR ALUMIN? OR AL OR TI OR TITANIUM# OR BORON# OR B OR TANTALUM# OR TA) (2A) (OXIDE# OR CARBIDE# OR NITRIDE#) SET PLURALS ON PERM
L24	2072	SEA ABB=ON	PLU=ON	SIO2 OR AL2O3 OR TIO2 OR TA2O3 OR ZRO OR Y2O3 OR BN OR ALN OR SI3N4 OR SIC OR TIC OR B4C OR TAC D COST

FILE 'HCAPLUS' - \*\*\*\* this is the full file.

L25 1116 SEA ABB=ON PLU=ON L9  
 L26 289 SEA ABB=ON PLU=ON L10 \* Nik, you can see there were not  
 L27 66516 SEA ABB=ON PLU=ON L11(2A)L12 many hits for Ru > 75%  
 L28 190126 SEA ABB=ON PLU=ON TAPE? OR DISK? OR DISKETTE? OR COMPACT(W) (D  
 ISK? OR DISC?) OR VIDEO# OR STORAGE?(W) (MEDIA? OR MEDIUM? OR  
 SUBSTANCE? OR MATERIAL?) OR HARD(W)DRIVE? OR DASD?  
 L29 2455825 SEA ABB=ON PLU=ON FILM? OR THINFILM? OR ULTRATHIN(W)FILM? OR  
 COAT? OR LAYER? OR OVERLAY? OR OVERLAID? OR TOPCOAT? OR  
 OVERCOAT?  
 L30 327216 SEA ABB=ON PLU=ON MULTILAYER? OR MULTIFILM? OR MULTICOAT? OR  
 MULTI(2A) (COAT? OR LAYER? OR FILM?) OR LAMEL? OR LAMIN?  
 L31 QUE ABB=ON PLU=ON SUBSTRAT? OR SURFACE? OR BASE# OR SUBSTRUCT  
 ? OR UNDERSTRUCT? OR UNDERLAY? OR FOUNDATION?  
 L32 31328 SEA ABB=ON PLU=ON COERCIV?  
 L33 1947 SEA ABB=ON PLU=ON (SIGNAL(W)NOISE# OR S/N) (2A)RATIO?  
 L34 16570 SEA ABB=ON PLU=ON S(W)N  
 L35 1533 SEA ABB=ON PLU=ON L20(2A)RATIO?  
 L36 3400 SEA ABB=ON PLU=ON L21 OR L19  
 L37 444018 SEA ABB=ON PLU=ON (SILICON OR SI OR ALUMIN? OR AL OR TI OR  
 TITANIUM# OR BORON# OR B OR TANTALUM# OR TA) (2A) (OXIDE# OR  
 CARBIDE# OR NITRIDE#)  
 SET PLURALS OFF  
 L38 737168 SEA ABB=ON SIO2 OR AL2O3 OR TIO2 OR TA2O3 OR ZRO OR Y2O3 OR  
 BN OR ALN OR SI3N4 OR SIC OR TIC OR B4C OR TAC  
 SET PLURALS ON PERM  
 L39 3476 SEA ABB=ON PLU=ON L8  
 L40 21316 SEA ABB=ON PLU=ON UNMAGNETIC? OR NONMAGNETIC OR MAGNET?(2A) (U  
 N OR NON)  
 L41 810030 SEA ABB=ON PLU=ON CD OR STORAGE? OR RECORD###  
 L42 1003998 SEA ABB=ON PLU=ON L27 OR L28 OR L41  
 L43 240273 SEA ABB=ON PLU=ON L27 OR L28  
 L45 79 SEA ABB=ON PLU=ON L25 AND L43  
 L46 435 SEA ABB=ON PLU=ON L39 AND L43  
 L47 573 SEA ABB=ON PLU=ON L39 AND L42  
 L48 20 SEA ABB=ON PLU=ON L26 AND L42  
 L49 14 SEA ABB=ON PLU=ON L26 AND L43  
 D SCAN  
 L50 2330 SEA ABB=ON PLU=ON (RU OR RUTHENIUM) (2A) (ALLOY?)  
 L51 2330 SEA ABB=ON PLU=ON (RU OR RUTHENIUM) (2A) (ALLOY?)  
 L52 2874 SEA ABB=ON PLU=ON L25 OR L51  
 L53 2461 SEA ABB=ON PLU=ON L26 OR L51  
 L54 4453 SEA ABB=ON PLU=ON L39 OR L51  
 L55 272 SEA ABB=ON PLU=ON L52 AND L42  
 L56 192 SEA ABB=ON PLU=ON L52 AND L43  
 L57 224 SEA ABB=ON PLU=ON L53 AND L42  
 L58 155 SEA ABB=ON PLU=ON L53 AND L43  
 L59 650 SEA ABB=ON PLU=ON L54 AND L42  
 L60 479 SEA ABB=ON PLU=ON L54 AND L43  
 L61 34 SEA ABB=ON PLU=ON L55 AND L40  
 L62 24 SEA ABB=ON PLU=ON L57 AND L40  
 L63 63 SEA ABB=ON PLU=ON L59 AND L40  
 L64 5 SEA ABB=ON PLU=ON L62 AND L30  
 L65 8 SEA ABB=ON PLU=ON L61 AND L30  
 L66 87 SEA ABB=ON PLU=ON L59 AND L30  
 L67 20 SEA ABB=ON PLU=ON L66 AND (L32 OR L36)  
 L68 13 SEA ABB=ON PLU=ON L67 AND L31  
 L69 20 SEA ABB=ON PLU=ON L26 AND L42  
 L70 107 SEA ABB=ON PLU=ON L25 AND L42  
 L71 573 SEA ABB=ON PLU=ON L39 AND L42  
 L72 7 SEA ABB=ON PLU=ON L69 AND L40

L73 21 SEA ABB=ON PLU=ON L70 AND L40  
 L74 53 SEA ABB=ON PLU=ON L71 AND L40  
 L75 6 SEA ABB=ON PLU=ON L73 AND L30  
 L76 20 SEA ABB=ON PLU=ON L73 AND L29  
 L77 4 SEA ABB=ON PLU=ON L76 AND (L32 OR L36)  
 L78 53 SEA ABB=ON PLU=ON L74 AND L40  
 L79 24 SEA ABB=ON PLU=ON L78 AND L30  
 L80 2 SEA ABB=ON PLU=ON L79 AND (L32 OR L36)  
 L81 14 SEA ABB=ON PLU=ON L79 AND L31  
 L82 9 SEA ABB=ON PLU=ON L64 OR L72 \*\*\* >75% Ru  
 L83 23 SEA ABB=ON PLU=ON L65 OR L73 OR L77 NOT L82 \*\* >20% Ru  
 L84 43 SEA ABB=ON PLU=ON (L68 OR L80 OR L81) NOT L82 OR L83  
 L85 41 SEA ABB=ON PLU=ON L84 AND L29  
 L86 27 SEA ABB=ON PLU=ON L85 AND L30  
 L87 26 SEA ABB=ON PLU=ON L86 AND L31 \*\*\* (smaller amounts of Ru)  
 L88 1 S L82 AND (L37 OR L38)  
 L89 2 S L83 AND (L37 OR L38)  
 L90 2 S L87 AND (L37 OR L38)  
 L91 4 S L85 AND (L37 OR L38)  
 L92 13 S L66 AND (L37 OR L38)  
 L93 11 S L92 NOT (L88 OR L89 OR L90 OR L91) \*\*\*\* oxides/nitrides etc.  
 => d L82 cbib abs hitind hitrn

L82 ANSWER 1 OF 9 HCAPLUS COPYRIGHT 2002 ACS

2002:539347 Document No. 137:102832 Manufacture of magnetic  
**recording** media. Shimizu, Kenji; Sakai, Hiroshi (Showa Denko K.  
 K., Japan). Jpn. Kokai Tokkyo Koho JP 2002203306 A2 20020719, 13 pp.  
 (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-401139 20001228.  
 AB Magnetic **recording** media contain, on **nonmagnetic**  
 substrates, **laminates** of at least soft magnetic base films,  
 orientation adjustment films which adjust the orientation of films right  
 above them, vertical magnetic films whose magnetization axis is vertically  
 oriented regarding the substrates, and protective films. The orientation  
 adjustment films comprise 1st layers having B2 structure and thickness of  
 0.1-20 nm, and 2nd layers having hcp structure and thickness of 0.1-50 nm.  
 The magnetic **recording** media have excellent noise characteristic  
 and experience little thermal fluctuation.  
 IC ICM G11B005-667  
 ICS G11B005-65; G11B005-738; G11B005-851; H01F010-08; H01F010-26;  
 H01F041-14  
 CC 77-8 (Magnetic Phenomena)  
 ST magnetic **recording** media orientation adjustment film  
 IT **Magnetic recording materials**  
 Magnetization  
 (manuf. of **magnetic recording** media contg.  
 orientation adjustment films)  
 IT Magnetic films  
 (manuf. of magnetic **recording** media contg. orientation  
 adjustment films and soft and hard magnetic films)  
 IT 7440-05-3, Palladium, uses 7440-18-8, Ruthenium, uses 7440-32-6,  
 Titanium, uses 7440-48-4, Cobalt, uses 7440-67-7, Zirconium, uses  
 11134-20-6, Cobalt 84, samarium 16 (atomic) 11148-13-3, Iron 20, nickel  
 80 (atomic) 12707-14-1, Aluminum 50, iron 50 (atomic) 12780-63-1,  
 Aluminum 50, nickel 50 (atomic) 57720-36-2, Chromium 45, cobalt 55  
 (atomic) 88873-10-3, Iron 85, zirconium 15 (atomic) 94470-26-5,  
 Chromium 40, cobalt 60 (atomic) 94858-24-9 104193-19-3, Cobalt 89,  
 niobium 7, zirconium 4 (atomic) 104675-01-6, Aluminum 55, nickel 45  
 (atomic) **136548-17-9**, Aluminum 50, ruthenium 50 (atomic)  
 341037-16-9, Chromium 22, cobalt 64, platinum 12, tantalum 2 (atomic)  
**365403-57-2**, Chromium 30, ruthenium 70 (atomic) 381243-05-6,

Nik, you can see Ru in this record 70 + 80 (next page)

Boron 4, chromium 20, cobalt 62, platinum 14 (atomic) **434335-34-9**, Ruthenium 80, titanium 20 (atomic) 441332-67-8, Aluminum 45, boron 10, nickel 45 (atomic) 441332-68-9, Chromium 17, cobalt 61, platinum 22 (atomic) 442550-25-6, Cobalt 90, tantalum 4, zirconium 6 (atomic) 442550-26-7, Iron 75, nitrogen 10, tantalum 15 (atomic) 442550-27-8, Chromium 35, cobalt 55, manganese 10 (atomic) 442550-28-9, Boron 5, chromium 30, cobalt 60, tantalum 5 (atomic)

RL: DEV (Device component use); USES (Uses)

(manuf. of magnetic **recording** media contg. orientation adjustment films, vertical magnetic films, soft magnetic films, and **nonmagnetic** intermediate films contg.)

IT 136548-17-9, Aluminum 50, ruthenium 50 (atomic)  
365403-57-2, Chromium 30, ruthenium 70 (atomic)  
434335-34-9, Ruthenium 80, titanium 20 (atomic)

RL: DEV (Device component use); USES (Uses)

(manuf. of magnetic **recording** media contg. orientation adjustment films, vertical magnetic films, soft magnetic films, and **nonmagnetic** intermediate films contg.)

L82 ANSWER 2 OF 9 HCAPLUS COPYRIGHT 2002 ACS

2002:518104 Document No. 137:102827 Magnetic **recording** medium, its manufacture, and magnetic **recording**/reproducing apparatus for it. Shimizu, Kenji; Sakai, Hiroshi (Showa Denko K. K., Japan). Jpn. Kokai Tokkyo Koho JP 2002197643 A2 20020712, 14 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-396074 20001226.

AB The **recording** medium comprises a **nonmagnetic** substrate on which a soft magnetic undercoat layer, an orientation-controlling film, a magnetic layer with axis of easy magnetization oriented perpendicular to the substrate, and a protective film are formed. In the undercoat layer, part or all of the surface facing to the orientation-controlling film is oxidized, and the oxidized layer has thickness  $\geq 0.1$  and  $< 3$  nm. The method for manufg. the **recording** medium involves a process for oxidization of the undercoat layer. The app. using the **recording** medium is also claimed. High-d. **recording** can be achieved by using the **recording** medium.

IC ICM G11B005-738

ICS G11B005-65; G11B005-667; G11B005-851

CC 77-8 (Magnetic Phenomena)

ST high density magnetic **recording** medium oxidization undercoat layer

IT Magnetic memory devices

**Magnetic recording materials**

Oxidation

(**magnetic recording** medium with surface-oxidized soft magnetic undercoat layer for high-d. **recording** /reproducing)

IT Gadolinium alloy, base

Hafnium alloy, base

Rhenium alloy, base

Terbium alloy, base

Yttrium alloy, base

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(orientation-controlling layer; magnetic **recording** medium with surface-oxidized soft magnetic undercoat layer for high-d. **recording**/reproducing)

IT 7440-05-3, Palladium, processes

RL: DEV (Device component use); PEP (Physical, engineering or chemical

process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(**lamine** with Co, perpendicular magnetic layer; magnetic **recording** medium with surface-oxidized soft magnetic undercoat layer for high-d. **recording**/reproducing)

IT 7440-48-4, Cobalt, processes

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(**lamine** with Pd, perpendicular magnetic layer; magnetic **recording** medium with surface-oxidized soft magnetic undercoat layer for high-d. **recording**/reproducing)

IT 7440-18-8, Ruthenium, processes 7440-32-6, Titanium, processes 7440-66-6, Zinc, processes 7440-67-7, Zirconium, processes 11114-55-9 12683-48-6 12707-14-1, Aluminum 50, iron 50 (atomic) 12780-63-1, Aluminum 50, nickel 50 (atomic) 12781-95-2 51880-05-8 55891-00-4 104675-01-6, Aluminum 55, nickel 45 (atomic) **136548-17-9**, Aluminum 50, ruthenium 50 (atomic) **434335-58-7**, Carbon 10, ruthenium 90 (atomic) **441332-66-7**, Boron 10, chromium 20, ruthenium 70 (atomic) 441332-67-8, Aluminum 45, boron 10, nickel 45 (atomic)

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(orientation-controlling layer; magnetic **recording** medium with surface-oxidized soft magnetic undercoat layer for high-d. **recording**/reproducing)

IT 94858-24-9 381243-05-6, Boron 4, chromium 20, cobalt 62, platinum 14 (atomic) 441332-68-9, Chromium 17, cobalt 61, platinum 22 (atomic)

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(perpendicular magnetic layer; magnetic **recording** medium with surface-oxidized soft magnetic undercoat layer for high-d. **recording**/reproducing)

IT 60569-79-1, Boron 20, iron 80 (atomic) 104193-19-3, Cobalt 89, niobium 7, zirconium 4 (atomic) 165253-39-4, Carbon 10, iron 80, tantalum 10 (atomic) 441332-61-2, Cobalt 89, niobium 5, zirconium 6 (atomic) 441332-62-3, Cobalt 89, niobium 3, yttrium 8 (atomic) 441332-63-4, Hafnium 10, iron 75, oxygen 15 (atomic) 441332-64-5, Iron 70, nitrogen 15, tantalum 15 (atomic) 441332-65-6, Iron 70, oxygen 15, zirconium 15 (atomic)

RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(undercoat layer; magnetic **recording** medium with surface-oxidized soft magnetic undercoat layer for high-d. **recording**/reproducing)

IT **136548-17-9**, Aluminum 50, ruthenium 50 (atomic) **434335-58-7**, Carbon 10, ruthenium 90 (atomic) **441332-66-7**, Boron 10, chromium 20, ruthenium 70 (atomic)

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(orientation-controlling layer; magnetic **recording** medium with surface-oxidized soft magnetic undercoat layer for high-d. **recording**/reproducing)

medium and magnetic **recording** apparatus with high **recording** density, suppressed noise and improved stability.  
 Kanbe, Tetsuya; Yahisa, Yotsuo; Matsuda, Yoshibumi; Inagaki, Jo; Sakamoto, Koji (Japan). U.S. Pat. Appl. Publ. US 2002064691 A1 20020530, 19 pp.  
 (English). CODEN: USXXCO. APPLICATION: US 2001-888523 20010626.  
 PRIORITY: JP 2000-313120 20001006; JP 2000-381692 20001211.

- AB The title longitudinal magnetic **recording** medium includes a **nonmagnetic** substrate, a 1st underlayer having at least one of an amorphous structure and a fine crystal structure formed on the **nonmagnetic** substrate, a 2nd underlayer having a bcc. structure formed on the 1st underlayer, a 3rd underlayer having a hexagonal closed packed structure formed on the 2nd underlayer, and a magnetic layer having the hexagonal closed packed structure formed on the 3rd underlayer, wherein the 3rd underlayer is composed of an alloy contg. Co and Ru.
- IC ICM G11B005-66
- NCL 428694000TS
- CC 77-8 (Magnetic Phenomena)  
 Section cross-reference(s): 56
- ST cobalt ruthenium alloy magnetic **recording**
- IT Crystal structure types  
 (bcc.; longitudinal magnetic **recording** medium and magnetic **recording** app. with high **recording** d., suppressed noise and improved stability)
- IT Crystal structure types  
 (hexagonal, closed packed; longitudinal magnetic **recording** medium and magnetic **recording** app. with high **recording** d., suppressed noise and improved stability)
- IT Magnetic films  
 (longitudinal magnetic **recording** medium and magnetic **recording** app. with high **recording** d., suppressed noise and improved stability)
- IT 94470-28-7, Cobalt 60, ruthenium 40 (atomic) 353474-74-5, Boron 8, chromium 20, cobalt 58, platinum 14 (atomic) 381243-05-6, Boron 4, chromium 20, cobalt 62, platinum 14 (atomic) 412942-18-8, Chromium 40, nickel 52, zirconium 8 (atomic) 412942-33-7, Boron 6, chromium 20, cobalt 60, platinum 14 (atomic) 412942-34-8, Boron 8, chromium 18, cobalt 58, platinum 16 (atomic) 412942-36-0, Boron 6, chromium 18, cobalt 62, platinum 14 (atomic) 412942-38-2, Boron 8, chromium 20, cobalt 56, platinum 16 (atomic)  
 RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
 (longitudinal magnetic **recording** medium and magnetic **recording** app. with high **recording** d., suppressed noise and improved stability)
- IT 52360-02-8, Nickel 62, tantalum 38 (atomic) 77592-17-7, Cobalt 50, ruthenium 50 (atomic) 120171-63-3, Cobalt 30, ruthenium 70 (atomic) 153084-87-8, Cobalt 70, ruthenium 30 (atomic) 273379-93-4, Cobalt 65, ruthenium 35 (atomic) 412942-08-6, Chromium 32, cobalt 62, zirconium 6 (atomic) 412942-10-0, Chromium 36, cobalt 56, tantalum 8 (atomic) 412942-11-1, Chromium 34, cobalt 41, tungsten 25 (atomic) 412942-12-2, Cobalt 54, titanium 6, vanadium 40 (atomic) 412942-13-3, Boron 8, cobalt 52, vanadium 40 (atomic) 412942-14-4, Cobalt 38, silicon 12, vanadium 50 (atomic) 412942-15-5, Cobalt 35, manganese 45, niobium 20 (atomic) 412942-16-6, Cobalt 30, manganese 45, molybdenum 25 (atomic) 412942-17-7, Nickel 45, tungsten 55 (atomic) 412942-19-9, Chromium 40, nickel 48, titanium 12 (atomic) 412942-20-2, Boron 15, nickel 35, vanadium 50 (atomic) 412942-21-3, Nickel 30, silicon 15, vanadium 55 (atomic) 412942-22-4, Molybdenum 30, nickel 32, vanadium 38 (atomic) 412942-25-7, Cobalt 40, ruthenium 60 (atomic) 412942-26-8, Boron 1,

cobalt 59, ruthenium 40 (atomic) 412942-27-9, Boron 3, cobalt 57, ruthenium 40 (atomic) 412942-28-0, Boron 6, cobalt 54, ruthenium 40 (atomic) 412942-29-1, Boron 12, cobalt 48, ruthenium 40 (atomic) 412942-30-4, Boron 15, cobalt 45, ruthenium 40 (atomic) 431898-42-9, Cobalt 70, molybdenum 10, titanium 20 (atomic) 431898-43-0, Cobalt 70, titanium 20, tungsten 10 (atomic) 431898-44-1, Cobalt 75, molybdenum 5, titanium 20 (atomic) 431898-45-2, Boron 3, cobalt 72, molybdenum 5, titanium 20 (atomic) 431898-46-3, Boron 3, cobalt 77, molybdenum 5, titanium 15 (atomic)

RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)

(longitudinal magnetic **recording** medium and magnetic **recording** app. with high **recording** d., suppressed noise and improved stability)

IT 12735-25-0 207224-28-0, Chromium 10, cobalt 60, zirconium 10 (atomic) 342384-06-9, Chromium 20, nickel 65, zirconium 15 (atomic) 431898-47-4, Cobalt 40-65, ruthenium 35-60 (atomic) 431898-48-5, Boron, cobalt, ruthenium **431898-49-6**, Cobalt bal., ruthenium 35-60, boron 1-12 (atomic) 431898-50-9, Cobalt bal., chromium 16-22, platinum 12-18, boron 4-12, tantalum 0-3 (atomic)

RL: TEM (Technical or engineered material use); USES (Uses)

(longitudinal magnetic **recording** medium and magnetic **recording** app. with high **recording** d., suppressed noise and improved stability)

IT **120171-63-3**, Cobalt 30, ruthenium 70 (atomic)

RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)

(longitudinal magnetic **recording** medium and magnetic **recording** app. with high **recording** d., suppressed noise and improved stability)

IT **431898-49-6**, Cobalt bal., ruthenium 35-60, boron 1-12 (atomic)

RL: TEM (Technical or engineered material use); USES (Uses)

(longitudinal magnetic **recording** medium and magnetic **recording** app. with high **recording** d., suppressed noise and improved stability)

L82 ANSWER 4 OF 9 HCAPLUS COPYRIGHT 2002 ACS

2002:345865 Document No. 136:362831 Magnetic **recording** medium for high density **recording**. Futamoto, Masaaki; Inaba, Nobuyuki; Hirayama, Yoshiyuki; Takeuchi, Teruaki; Honda, Yukio (Hitachi Ltd., Japan). U.S. US 6383667 B1 20020507, 20 pp. (English). CODEN: USXXAM. APPLICATION: US 1999-413813 19991007. PRIORITY: JP 1998-288134 19981009; JP 1999-45884 19990224.

AB The present invention relates to a magnetic **recording** medium that has a magnetic film suitable for high-d. magnetic **recording**. The magnetic **recording** medium includes a substrate, an underlayer provided on the substrate, a Co alloy magnetic film formed through the underlayer, and a protective film for protecting the magnetic film, in which the underlayer has a 2-layer structure of an lower underlayer contacted with the substrate and an upper underlayer contacted with the Co alloy magnetic film, the upper underlayer is a Co-Crx-My alloy film having a hcp. structure, where 25 at.%  $\leq x+y \leq 50$  at.%, 0.5 at.%  $\leq y$ , and **non-magnetic** element M is selected from the group of elements B, Si, Ge, C, Al, P, Ti, V, Nb, Zr, Hf, Mn, Rh, Os, Ir, Re, Pd, Pt, Mo, Ta, W, Ag and Au. Thereby the medium can be increased in its coercive force and can be improved in its thermal stability characteristics.

IC ICM G11B005-66

ICS G11B005-70

NCL 428694000TS



CC 77-8 (Magnetic Phenomena)  
Section cross-reference(s): 56

ST chromium cobalt alloy magnetic **recording** medium

IT Coercive force (magnetic)  
Thermal stability  
(improvement of; magnetic **recording** medium for high d. **recording**)

IT Magnetic films  
**Magnetic recording materials**  
(magnetic **recording** medium for high d. **recording**)

IT 1314-23-4, Zirconia, uses 7440-03-1, Niobium, uses 7440-21-3, Silicon, uses 7440-32-6, Titanium, uses 7440-47-3, Chromium, uses 7440-58-6, Hafnium, uses 7440-67-7, Zirconium, uses 7631-86-9, Silica, uses 12381-52-1, Chromium silicide (CrSi<sub>3</sub>) 12797-58-9  
RL: TEM (Technical or engineered material use); USES (Uses)  
(adhesion layer; magnetic **recording** medium for high d. **recording**)

IT 197803-58-0 421550-46-1 421550-47-2 421550-48-3 421550-49-4  
421550-50-7 421550-51-8 421550-52-9 421550-53-0 421550-54-1  
421550-55-2 421550-56-3 421550-57-4 421550-58-5 421550-61-0  
421550-64-3 421550-67-6 421550-68-7 421550-69-8 421550-70-1  
RL: TEM (Technical or engineered material use); USES (Uses)  
(film **material**; magnetic **recording** medium for high d. **recording**)

IT 1309-48-4, Magnesium oxide (MgO), uses 7789-24-4, Lithium fluoride (LiF), uses 11114-55-9 11114-60-6 11114-68-4 11143-56-9  
11147-86-7 12682-24-5 39286-82-3 39314-47-1 39460-27-0  
51614-60-9 59124-11-7 77592-17-7, Cobalt 50, ruthenium 50 (atomic)  
94470-28-7, Cobalt 60, ruthenium 40 (atomic) 147099-05-6, Cobalt 90, ruthenium 10 (atomic) 153084-87-8 160619-62-5, Cobalt 80, ruthenium 20 (atomic) 273379-93-4, Cobalt 65, ruthenium 35 (atomic) 341036-30-4  
366476-02-0 412942-25-7 **421550-72-3 421550-73-4**  
**421550-74-5** 421550-75-6 421550-76-7 421550-77-8  
**421550-78-9 421550-79-0** 421550-80-3 421550-81-4  
421550-82-5 421550-83-6 421550-84-7 421550-85-8 421550-86-9  
421550-87-0 421550-88-1 421550-89-2 421550-90-5  
RL: TEM (Technical or engineered material use); USES (Uses)  
(lower underlayer; magnetic **recording** medium for high d. **recording**)

IT 96439-26-8 213332-70-8, Chromium 30, cobalt 66, titanium 4 (atomic)  
323187-06-0, Chromium 30, cobalt 60, manganese 10 (atomic) 421550-28-9  
421550-29-0 421550-30-3 421550-31-4 421550-32-5 421550-33-6  
421550-34-7 421550-35-8 421550-36-9 421550-37-0 421550-39-2  
421550-40-5 421550-41-6 421550-42-7 421550-43-8 421550-44-9  
421550-45-0  
RL: TEM (Technical or engineered material use); USES (Uses)  
(magnetic **recording** medium for high d. **recording**)

IT 294626-73-6, Boron 6, chromium 25, cobalt 69 (atomic) 294626-75-8, Chromium 25, cobalt 67, silicon 8 (atomic) 294626-77-0, Chromium 25, cobalt 65, germanium 10 (atomic) 294626-79-2, Aluminum 4, chromium 25, cobalt 71 (atomic) 294626-81-6, Chromium 25, cobalt 69, phosphorus 6 (atomic) 294626-83-8, Chromium 25, cobalt 69, titanium 6 (atomic) 294626-85-0, Chromium 25, cobalt 65, vanadium 10 (atomic) 294626-87-2, Chromium 25, cobalt 71, zirconium 4 (atomic) 294626-89-4, Chromium 25, cobalt 67, niobium 8 (atomic) 294626-91-8, Chromium 25, cobalt 69, hafnium 6 (atomic) 294626-93-0, Chromium 25, cobalt 65, manganese 10 (atomic) 294626-95-2, Chromium 25, cobalt 63, rhodium 12 (atomic) 294626-97-4, Chromium 25, cobalt 57, iridium 18 (atomic) 294626-99-6, Chromium 25, cobalt 61, rhenium 14 (atomic) 294627-01-3, Chromium 25,

cobalt 67, palladium 8 (atomic) 294627-03-5, Chromium 25, cobalt 69, platinum 6 (atomic) 294627-05-7, Chromium 25, cobalt 71, molybdenum 4 (atomic) 294627-07-9, Chromium 25, cobalt 67, tungsten 8 (atomic) 294627-09-1, Chromium 25, cobalt 71, silver 4 (atomic) 294627-11-5, Chromium 25, cobalt 69, gold 6 (atomic)

RL: TEM (Technical or engineered material use); USES (Uses)  
(upper underlayer; magnetic **recording** medium for high d.  
**recording**)

IT 421550-72-3 421550-73-4 421550-74-5  
421550-78-9 421550-79-0

RL: TEM (Technical or engineered material use); USES (Uses)  
(lower underlayer; magnetic **recording** medium for high d.  
**recording**)

L82 ANSWER 5 OF 9 HCAPLUS COPYRIGHT 2002 ACS

2002:292134 Document No. 136:334092 Magnetic **recording** medium and magnetic memory device. Kamibe, Tetsuya; Yaku, Hiroo; Matsuda, Yoshifumi; Inagaki, Yuzuru; Sakamoto, Koji (Hitachi Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2002117531 A2 20020419, 10 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-313120 20001006.

AB A low-noise and stable magnetic **recording** medium comprises a non-magnetic substrate, an amorphous or micro-cryst. first underlayer, a second underlayer having a body-centered cubic structure, a Co-Ru alloy third underlayer having a hexagonal dense structure, and a magnetic layer on the third underlayer. Addnl., the third underlayer may contain B. A magnetic memory device having the above medium is also described.

ICM G11B005-738

ICS C23C014-06; G11B005-65; H01F010-30

CC 77-8 (Magnetic Phenomena)

ST magnetic **recording** app cobalt ruthenium alloy underlayer

IT Magnetic memory devices

(Co-Ru alloy underlayer in magnetic **recording** medium and magnetic memory device)

IT 273379-93-4

RL: DEV (Device component use); USES (Uses)

(CCo-Ru alloy underlayer in magnetic **recording** medium and magnetic memory device)

IT 7440-47-3, Chromium, uses 12735-25-0 77592-17-7 79665-67-1  
94470-28-7 108801-62-3 109375-39-5 110431-79-3 **120171-63-3**  
153084-87-8 153929-41-0 153929-42-1 167498-56-8 308356-82-3  
353474-74-5 412942-08-6 412942-09-7 412942-10-0 412942-11-1  
412942-12-2 412942-13-3 412942-14-4 412942-15-5 412942-16-6  
412942-17-7 412942-18-8 412942-19-9 412942-20-2 412942-21-3  
412942-22-4 412942-24-6 412942-25-7 412942-26-8 412942-27-9  
412942-28-0 412942-29-1 412942-30-4 412942-31-5 412942-32-6  
412942-33-7 412942-34-8 412942-36-0 412942-37-1 412942-38-2  
412942-39-3 412942-40-6

RL: DEV (Device component use); USES (Uses)

(Co-Ru alloy underlayer in magnetic **recording** medium and magnetic memory device)

IT **120171-63-3**

RL: DEV (Device component use); USES (Uses)

(Co-Ru alloy underlayer in magnetic **recording** medium and magnetic memory device)

L82 ANSWER 6 OF 9 HCAPLUS COPYRIGHT 2002 ACS

2001:745602 Document No. 135:297466 Perpendicular magnetic **recording** medium involving ruthenium alloy underlayer and magnetic **recording** apparatus. Oikawa, Soichi; Hikosaka, Kazushi (Toshiba Corp., Japan).

Jpn. Kokai Tokkyo Koho JP 2001283428 A2 20011012, 8 pp. (Japanese).  
CODEN: JKXXAF. APPLICATION: JP 2000-94552 20000330.

- AB The **recording** medium has a **nonmagnetic** support, an underlayer on the support, a magnetic layer on the underlayer, and a protective layer on the magnetic layer wherein the magnetic layer is made of a Co-based alloy and the underlayer is made of an alloy based on .gtoreq.60 at.% Ru and a body-centered cubic material. Alternatively, the medium involves a double layer underlayer comprising a Ti (alloy or compd.) layer and the Ru alloy layer. The **recording** medium shows reduced noise. The **recording** app. involves the magnetic **recording** medium, a means of supporting of the medium and of driving rotation of the medium, a means of **recording** information on the medium and of reproducing information from the medium, and a means of supporting the **recording** means.
- IC ICM G11B005-738  
ICS G11B005-64; G11B005-66
- CC 77-8 (Magnetic Phenomena)  
Section cross-reference(s): 56
- ST perpendicular magnetic **recording** medium underlayer; cobalt alloy magnetic **recording** medium; ruthenium alloy underlayer magnetic **recording** medium; bcc material alloy; noise reduced magnetic **recording** medium app
- IT **Magnetic disks**  
Magnetic memory devices  
(perpendicular **magnetic recording** medium involving ruthenium alloy underlayer with reduced noise for magnetic **recording** app.)
- IT Magnetic materials  
(soft; in perpendicular magnetic **recording** medium involving ruthenium alloy underlayer with reduced noise for magnetic **recording** app.)
- IT Glass, uses  
RL: DEV (Device component use); USES (Uses)  
(support; in perpendicular magnetic **recording** medium involving ruthenium alloy underlayer with reduced noise for magnetic **recording** app.)
- IT 93511-57-0  
RL: DEV (Device component use); USES (Uses)  
(intermediate layer; in perpendicular magnetic **recording** medium involving ruthenium alloy underlayer with reduced noise for magnetic **recording** app.)
- IT 189817-15-0, Chromium cobalt platinum oxide  
RL: DEV (Device component use); USES (Uses)  
(magnetic; perpendicular magnetic **recording** medium involving ruthenium alloy underlayer with reduced noise for magnetic **recording** app.)
- IT **365403-56-1 365403-57-2**  
RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(sputtering target; for prepn. of perpendicular magnetic **recording** medium involving ruthenium alloy underlayer with reduced noise)
- IT 7440-32-6, Titanium, uses 25583-20-4, Titanium nitride 59124-09-3  
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)  
(underlayer; perpendicular magnetic **recording** medium involving ruthenium alloy underlayer with reduced noise for magnetic **recording** app.)
- IT **365403-56-1 365403-57-2**  
RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(sputtering target; for prepn. of perpendicular magnetic

**recording** medium involving ruthenium alloy underlayer with reduced noise)

L82 ANSWER 7 OF 9 HCAPLUS COPYRIGHT 2002 ACS

2000:876843 Document No. 134:50487 Magnetic **recording** medium, magnetic **storage** apparatus, **recording** method and method of producing magnetic **recording** medium. Abarra, E. Noel; Okamoto, Iwao; Mizoshita, Yoshifumi; Yoshida, Yuki; Umeda, Hisashi; Suzuki, Masaya; Akimoto, Hideyuki; Sato, Hisateru; Kaitsu, Isatake (Fujitsu Limited, Japan). Eur. Pat. Appl. EP 1059629 A2 20001213, 57 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW. APPLICATION: EP 2000-304517 20000526. PRIORITY: JP 1999-161329 19990608; JP 2000-107075 20000407; JP 2000-107071 20000407; JP 2000-107076 20000407; JP 2000-107074 20000407; JP 2000-107072 20000407.

AB A magnetic **recording** medium is provided with at least one exchange layer structure, and a magnetic layer (9) formed on the exchange layer structure. The exchange layer structure includes a ferromagnetic layer (7) and a **nonmagnetic** coupling layer (8) provided on the ferromagnetic layer (7) and under the magnetic layer (9).

IC G11B005-00; G11B005-02; G11B005-64

CC 77-8 (Magnetic Phenomena)  
Section cross-reference(s): 55, 56

ST **magnetic recording material**  
**multilayer** alloy

IT Electronic device fabrication  
Ferromagnetic films  
Magnetic films  
Magnetic memory devices  
Magnetic **multilayers**

**Magnetic recording materials**

(**magnetic recording** medium, **magnetic storage** app., **recording** method and method of producing magnetic **recording** medium)

IT Ceramics

(**magnetic recording** medium, **magnetic storage** app., **recording** method and method of producing magnetic **recording** medium using)

IT Oxides (inorganic), processes

RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
(**magnetic recording** medium, **magnetic storage** app., **recording** method and method of producing magnetic **recording** medium using)

IT Chromium alloy, base

Cobalt alloy, base

Copper alloy, base

Iridium alloy, base

Iron alloy, base

Nickel alloy, base

**Ruthenium alloy**, base

RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
(**magnetic recording** medium, **magnetic storage** app., **recording** method and method of producing magnetic **recording** medium)

IT 7439-88-5, Iridium, processes 7440-16-6, Rhodium, processes 7440-18-8, Ruthenium, processes 11134-15-9 12715-58-1 12735-25-0 59124-09-3 66993-02-0 77325-66-7 92839-06-0 137850-97-6 159744-62-4 177899-00-2 197587-27-2, Chromium 37, cobalt 63 (atomic)

261352-06-1, Cobalt 20, ruthenium 80 (atomic) 312602-06-5  
 , Chromium 20, ruthenium 80 (atomic) 312602-09-8, Iron 20,  
 ruthenium 80 (atomic) 312602-11-2, Manganese 20, ruthenium 80  
 (atomic) 312602-14-5, Nickel 10, ruthenium 90 (atomic)  
 312602-17-8, Chromium 95, molybdenum 2.5, tungsten 2.5 (atomic)  
 312602-21-4, Chromium 80, molybdenum 10, tungsten 10 (atomic)  
 312602-24-7, Boron 4, chromium 22, cobalt 63, platinum 11 (atomic)  
 312602-29-2, Chromium, cobalt base, molybdenum, platinum 312602-32-7,  
 Chromium, cobalt base, niobium, platinum 312602-36-1, Chromium, cobalt  
 base, platinum, tungsten 312602-41-8, Chromium, cobalt base, copper,  
 platinum 312602-45-2, Cobalt 50-100, ruthenium 0-50 (atomic)  
 312602-49-6, Chromium 50-100, ruthenium 0-50 (atomic) 312602-55-4  
 , Iron 0-60, ruthenium 40-100 (atomic) 312602-61-2, Nickel 0-10,  
 ruthenium 90-100 (atomic) 312602-69-0, Manganese 0-50, ruthenium  
 50-100 (atomic)

RL: PEP (Physical, engineering or chemical process); TEM (Technical or  
 engineered material use); PROC (Process); USES (Uses)

(magnetic **recording** medium, magnetic **storage** app.,  
**recording** method and method of producing magnetic  
**recording** medium)

IT 261352-06-1, Cobalt 20, ruthenium 80 (atomic) 312602-06-5  
 , Chromium 20, ruthenium 80 (atomic) 312602-09-8, Iron 20,  
 ruthenium 80 (atomic) 312602-11-2, Manganese 20, ruthenium 80  
 (atomic) 312602-14-5, Nickel 10, ruthenium 90 (atomic)  
 312602-55-4, Iron 0-60, ruthenium 40-100 (atomic)  
 312602-61-2, Nickel 0-10, ruthenium 90-100 (atomic)  
 312602-69-0, Manganese 0-50, ruthenium 50-100 (atomic)

RL: PEP (Physical, engineering or chemical process); TEM (Technical or  
 engineered material use); PROC (Process); USES (Uses)

(magnetic **recording** medium, magnetic **storage** app.,  
**recording** method and method of producing magnetic  
**recording** medium)

L82 ANSWER 8 OF 9 HCAPLUS COPYRIGHT 2002 ACS

1995:837724 Document No. 123:245060 **Multilayer** magnetoresistive  
 sensor, its preparation, and a magnetic **storage** system using it.  
 Coffey, Kevin R.; Fontana, Robert E.; Howard, James K.; Hylton, Todd L.;  
 Parker, Michael A.; Tsang, Ching H. (International Business Machines  
 Corp., USA). Can. Pat. Appl. CA 2134711 AA 19950624, 35 pp. (English).  
 CODEN: CPXXEB. APPLICATION: CA 1994-2134711 19941031. PRIORITY: US  
 1993-173590 19931223.

AB A magnetoresistive read sensor incorporates a **multilayer** sensing  
 element formed of .gtoreq.1 magnetoresistive elements in a planar array,  
 each magnetoresistive element having a **multilayer** structure of  
 .gtoreq.2 ferromagnetic layers sepd. by a **nonmagnetic** layer.  
 The ferromagnetic layers are coupled antiferromagnetically by  
 magnetostatic coupling at opposing edges of the ferromagnetic layers. A  
 bias layer sepd. from the magnetoresistive sensing element by a spacer  
 layer provides a magnetic field to bias the magnetoresistive sensing  
 element at a desired nonsignal point for linear response. The  
 magnetoresistive sensing element is formed by alternately depositing  
 layers of ferromagnetic material and layers of **nonmagnetic**  
 material on a substrate and then patterning the resulting structure using  
 photolithog. techniques to provide a planar array of magnetoresistive  
 elements. A conductive layer is deposited over the array, filling in the  
 spaces sepg. the magnetoresistive elements, to provide elec. cond. between  
 the elements in the plane of the structure.

IC ICM G11B005-39  
 ICS G11B005-706; G01N027-72  
 CC 77-8 (Magnetic Phenomena)

- Section cross-reference(s): 76
- ST **multilayer** magnetoresistive sensor prepn; magnetic storage system **multilayer** magnetoresistive sensor; recording head **multilayer** magnetoresistive
- IT Sensors  
(magnetoresistive, **multilayer**; for magnetic storage systems)
- IT Electric conductors  
(**multilayer** magnetoresistive sensors contg.)
- IT Magnetoresistors  
(sensors from, **multilayer**; for magnetic storage systems)
- IT **Magnetic substances**  
(ferro-, **multilayer** magnetoresistive sensors contg.)
- IT Lithography  
(photo-, in manuf. of **multilayer** magnetoresistive sensors)
- IT Cobalt alloy, base  
Copper alloy, base  
Gold alloy, base  
Iron alloy, base  
Nickel alloy, base  
**Ruthenium alloy**, base  
Silver alloy, base  
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(manuf. of **multilayer** magnetoresistive sensors contg.)
- IT 1344-28-1, Alumina, processes 7429-90-5, Aluminum, processes 7439-89-6, Iron, processes 7440-02-0, Nickel, processes 7440-18-8, Ruthenium, processes 7440-22-4, Silver, processes 7440-25-7, Tantalum, processes 7440-32-6, Titanium, processes 7440-47-3, Chromium, processes 7440-48-4, Cobalt, processes 7440-50-8, Copper, processes 7440-57-5, Gold, processes 7440-58-6, Hafnium, processes 7440-65-5, Yttrium, processes 7440-67-7, Zirconium, processes 7631-86-9, Silica, processes 11148-32-6 12649-48-8 91867-19-5 168754-63-0  
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(manuf. of **multilayer** magnetoresistive sensors contg.)
- L82 ANSWER 9 OF 9 HCAPLUS COPYRIGHT 2002 ACS
- 1987:603185 Document No. 107:203185 Ferromagnetic materials. Ootomo, Moichi; Nakatani, Ryoichi; Kumasaka, Takayuki; Yamashita, Takeo; Saito, Noritoshi; Kobayashi, Toshio (Hitachi, Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 62139846 A2 19870623 Showa, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1985-278924 19851213.
- AB An Fe alloy contains >0.1 at.% Ru, Rh, Pd, Ir, and/or Pt. The platinum metals in the alloy are controlled in accordance with 2 .ltoreq. (3.4 Ru + 2.8 Rh + 4.7 Pd + 6 Ir + 6.5 Pt) .ltoreq.6. A monolayer film of the Fe alloy or, optionally, a **multilayer** film consisting of an interlayer (magnetic or **nonmagnetic**) 20-500 .ANG. thick sandwiched between 2 layers of the Fe alloy, each 0.02-0.5 .mu. thick, shows high magnetic satn., low magnetostriction, and high corrosion resistance. The films are suitable for magnetic heads for **video tape recorders**. Thus, a Fe99Ru1 film .apprx.1.mu. thick was manufd. by sputter coating the alloy on a glass substrate. The film showed a magnetic satn. 20.8 kG, a coercive force 2.0 Oe, a magnetostriction coeff. -0.1 .times. 10-6, and a relative decrease in magnetic satn. after a salt-water-spray test 9% vs. 18 kG, 2.3 Oe, 0.2 .times. 10-6, and 57%, resp., for similarly manufd. Fe88Si12 films.
- IC ICM C22C038-00

ICS C23C014-14; G11B005-127; H01F001-14  
CC 55-3 (Ferrous Metals and Alloys)  
Section cross-reference(s): 77  
ST **ruthenium iron alloy** magnetic film; magnetic head  
**ruthenium iron alloy**  
IT **Recording materials**  
(**magnetic**, iron-platinum metal alloys for)  
IT 12614-48-1 91018-24-5 111148-20-0 111148-21-1 111148-22-2  
111148-23-3 111148-24-4 111148-25-5 111148-26-6  
RL: USES (Uses)  
(magnetic satn. and magnetostriction of, for magnetic heads of  
**video tape recorders**)

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L83 ANSWER 1 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
2002:609899 Document No. 137:162694 Magnetic **recording** medium with  
a NiAlRu seed layer. Wu, Stella Z.; Chen, Qixu; Harkness, Samuel D., IV;  
Ranjan, Rajiv Y. (Seagate Technology LLC, USA). U.S. US 6432562 B1  
20020813, 7 pp. (English). CODEN: USXXAM. APPLICATION: US 1999-393328  
19990910. PRIORITY: US 1998-PV101902 19980925.  
AB High areal d. magnetic **recording** media exhibiting high magnetic  
performance, e.g., narrow PW50, and high OW, and high SNR, are formed with  
a NiAlRu seed layer. Embodiments of the present invention include sputter  
depositing a NiAlRu seedlayer on a **nonmagnetic** substrate and  
sequentially depositing thereon a Cr or Cr alloy underlayer, e.g., CrMo,  
CrMn, CrV or CrW, a magnetic layer, e.g., a Co-Cr-contg. magnetic alloy  
layer, and a protective overcoat, e.g., a C-contg. protective overcoat.  
IC ICM G11B005-66  
ICS G11B005-70; B05D005-12; C23C014-34  
NCL 428694000TS  
CC 77-8 (Magnetic Phenomena)  
Section cross-reference(s): 56  
ST seed layer aluminum nickel ruthenium sputtering **magnetic**  
**disk**  
IT **Magnetic disks**  
Magnetic films  
**Magnetic recording materials**  
Sputtering  
(**magnetic recording** medium with sputtered  
aluminum-nickel-ruthenium seed layer)  
IT Chromium alloy, base  
RL: PEP (Physical, engineering or chemical process); PYP (Physical  
process); TEM (Technical or engineered material use); PROC (Process); USES  
(Uses)  
(magnetic **recording** medium with sputtered  
aluminum-nickel-ruthenium seed layer)  
IT 7440-47-3, Chromium, processes 223426-73-1, Aluminum 50, nickel 45,  
ruthenium 5 (atomic)  
RL: PEP (Physical, engineering or chemical process); PYP (Physical  
process); TEM (Technical or engineered material use); PROC (Process); USES  
(Uses)  
(magnetic **recording** medium with sputtered  
aluminum-nickel-ruthenium seed layer)  
IT 11114-92-4 39314-47-1 81705-66-0 91033-96-4 142295-96-3  
155837-44-8, Chromium 50-100, molybdenum 0-50 (atomic) 215952-38-8  
445306-86-5, Chromium 50-100, manganese 0-50 (atomic) 445306-87-6,  
Chromium 50-100, tungsten 0-50 (atomic) **445306-88-7**, Aluminum  
45-55, nickel 40-50, ruthenium 0.1-10 (atomic) 445306-89-8, Aluminum 50,

- nickel 44-46, ruthenium 4-6 (atomic) 445306-90-1, Aluminum 45-55, nickel 40-50, ruthenium 4-6 (atomic)  
RL: TEM (Technical or engineered material use); USES (Uses)  
(magnetic **recording** medium with sputtered aluminum-nickel-ruthenium seed layer)
- IT **445306-88-7**, Aluminum 45-55, nickel 40-50, ruthenium 0.1-10 (atomic)  
RL: TEM (Technical or engineered material use); USES (Uses)  
(magnetic **recording** medium with sputtered aluminum-nickel-ruthenium seed layer)
- L83 ANSWER 2 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
2002:553441 Document No. 137:118427 Low-noise **magnetic recording materials**, their manufacture, and magnetic **recording** apparatus. Uesumi, Hiroyuki; Oikawa, Tadaaki; Shimizu, Takahiro; Takizawa, Naoki (Fuji Electric Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2002208126 A2 20020726, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-748 20010105.
- AB The **recording** material comprises (a) a **nonmagnetic** plastic support, (b) a **nonmagnetic** primer layer, (c) a 1st **nonmagnetic** metal interlayer, (d) a 2nd **nonmagnetic** metal interlayer, (e) a magnetic layer contg. Co- and Pt-contg. ferromagnetic grains and oxide grain boundaries, (f) a protective layer, and (g) a liq. lubricant layer, formed in the order. In the material, the 1st **nonmagnetic** interlayer contains Ru, Re, and/or Os and O and the 2nd **nonmagnetic** interlayer is Co-Cr alloys contg. Nb, Mo, Ru, Rh, Pd, Ta, W, Re, Os, Ir, and/or Pt, or vice versa. Manuf. of the materials and **recording** app. including the materials are also claimed.
- IC ICM G11B005-65  
ICS G11B005-73; G11B005-738; G11B005-84; H01F010-28; H01F010-30
- CC 77-8 (Magnetic Phenomena)
- ST **nonmagnetic** metal interlayer **magnetic disk**;  
magnetic **recording** app low noise **disk**
- IT Polycarbonates, uses  
Polyolefins  
RL: DEV (Device component use); USES (Uses)  
(**disk** supports; low-noise **magnetic recording materials** with bilayered **nonmagnetic** metal layers)
- IT **Magnetic disks**  
(low-noise **magnetic recording materials** with bilayered **nonmagnetic** metal layers)
- IT 7631-86-9, Silica, uses  
RL: DEV (Device component use); USES (Uses)  
(magnetic layer contg.; low-noise **magnetic recording materials** with bilayered **nonmagnetic** metal layers)
- IT 129516-26-3, Chromium 10, cobalt 78, platinum 12 (atomic)  
RL: DEV (Device component use); USES (Uses)  
(magnetic layer; low-noise **magnetic recording materials** with bilayered **nonmagnetic** metal layers)
- IT 7439-88-5, Iridium, uses 7439-98-7, Molybdenum, uses 7440-03-1, Niobium, uses 7440-04-2, Osmium, uses 7440-05-3, Palladium, uses 7440-15-5, Rhenium, uses 7440-16-6, Rhodium, uses 7440-25-7, Tantalum, uses  
RL: DEV (Device component use); USES (Uses)  
(**nonmagnetic** chromium-cobalt interlayer contg.; low-noise **magnetic recording materials** with bilayered **nonmagnetic** metal layers)
- IT 7440-18-8, Ruthenium, uses 7782-44-7, Oxygen, uses



RL: DEV (Device component use); USES (Uses)  
(**nonmagnetic** interlayer contg.; low-noise **magnetic recording materials** with bilayered **nonmagnetic** metal layers)

IT 341036-31-5, Chromium 25, cobalt 50, ruthenium 25 (atomic)  
443684-12-6, Chromium 35, cobalt 50, ruthenium 15 (atomic)  
443684-13-7, Chromium 40, cobalt 50, tungsten 10 (atomic) 443684-14-8,  
Chromium 44, cobalt 50, platinum 6 (atomic) 443684-15-9, Chromium 38,  
cobalt 50, platinum 12 (atomic)

RL: DEV (Device component use); USES (Uses)  
(**nonmagnetic** interlayer; low-noise **magnetic recording materials** with bilayered **nonmagnetic** metal layers)

IT 7440-47-3, Chromium, uses 37373-03-8, Chromium 80, molybdenum 20  
(atomic)

RL: DEV (Device component use); USES (Uses)  
(**nonmagnetic** primer layer; low-noise **magnetic recording materials** with bilayered **nonmagnetic** metal layers)

IT 341036-31-5, Chromium 25, cobalt 50, ruthenium 25 (atomic)  
443684-12-6, Chromium 35, cobalt 50, ruthenium 15 (atomic)

RL: DEV (Device component use); USES (Uses)  
(**nonmagnetic** interlayer; low-noise **magnetic recording materials** with bilayered **nonmagnetic** metal layers)

L83 ANSWER 3 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
2002:539347 Document No. 137:102832 Manufacture of magnetic **recording media**. Shimizu, Kenji; Sakai, Hiroshi (Showa Denko K. K., Japan). Jpn. Kokai Tokkyo Koho JP 2002203306 A2 20020719, 13 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-401139 20001228.

AB Magnetic **recording media** contain, on **nonmagnetic** substrates, **laminates** of at least soft magnetic base films, orientation adjustment films which adjust the orientation of films right above them, vertical magnetic films whose magnetization axis is vertically oriented regarding the substrates, and protective films. The orientation adjustment films comprise 1st layers having B2 structure and thickness of 0.1-20 nm, and 2nd layers having hcp structure and thickness of 0.1-50 nm. The magnetic **recording media** have excellent noise characteristic and experience little thermal fluctuation.

IC ICM G11B005-667  
ICS G11B005-65; G11B005-738; G11B005-851; H01F010-08; H01F010-26;  
H01F041-14

CC 77-8 (Magnetic Phenomena)

ST magnetic **recording media** orientation adjustment film

IT **Magnetic recording materials**  
Magnetization  
(manuf. of **magnetic recording media** contg. orientation adjustment films)

IT Magnetic films  
(manuf. of magnetic **recording media** contg. orientation adjustment films and soft and hard magnetic films)

IT 7440-05-3, Palladium, uses 7440-18-8, Ruthenium, uses 7440-32-6, Titanium, uses 7440-48-4, Cobalt, uses 7440-67-7, Zirconium, uses 11134-20-6, Cobalt 84, samarium 16 (atomic) 11148-13-3, Iron 20, nickel 80 (atomic) 12707-14-1, Aluminum 50, iron 50 (atomic) 12780-63-1, Aluminum 50, nickel 50 (atomic) 57720-36-2, Chromium 45, cobalt 55 (atomic) 88873-10-3, Iron 85, zirconium 15 (atomic) 94470-26-5, Chromium 40, cobalt 60 (atomic) 94858-24-9 104193-19-3, Cobalt 89, niobium 7, zirconium 4 (atomic) 104675-01-6, Aluminum 55, nickel 45

(atomic) **136548-17-9**, Aluminum 50, ruthenium 50 (atomic)  
341037-16-9, Chromium 22, cobalt 64, platinum 12, tantalum 2 (atomic)  
**365403-57-2**, Chromium 30, ruthenium 70 (atomic) 381243-05-6,  
Boron 4, chromium 20, cobalt 62, platinum 14 (atomic) **434335-34-9**  
, Ruthenium 80, titanium 20 (atomic) 441332-67-8, Aluminum 45, boron 10,  
nickel 45 (atomic) 441332-68-9, Chromium 17, cobalt 61, platinum 22  
(atomic) 442550-25-6, Cobalt 90, tantalum 4, zirconium 6 (atomic)  
442550-26-7, Iron 75, nitrogen 10, tantalum 15 (atomic) 442550-27-8,  
Chromium 35, cobalt 55, manganese 10 (atomic) 442550-28-9, Boron 5,  
chromium 30, cobalt 60, tantalum 5 (atomic)

RL: DEV (Device component use); USES (Uses)

(manuf. of magnetic **recording** media contg. orientation  
adjustment films, vertical magnetic films, soft magnetic films, and  
**nonmagnetic** intermediate films contg.)

IT **136548-17-9**, Aluminum 50, ruthenium 50 (atomic)  
**365403-57-2**, Chromium 30, ruthenium 70 (atomic)  
**434335-34-9**, Ruthenium 80, titanium 20 (atomic)

RL: DEV (Device component use); USES (Uses)

(manuf. of magnetic **recording** media contg. orientation  
adjustment films, vertical magnetic films, soft magnetic films, and  
**nonmagnetic** intermediate films contg.)

L83 ANSWER 4 OF 23 HCAPLUS COPYRIGHT 2002 ACS

2002:521191 Document No. 137:102829 Magnetic **recording** medium, its  
manufacture, and magnetic input/output apparatus using the medium.  
Shimizu, Kenji; Sakai, Hiroshi; Yang, Hui; Sakawaki, Akira (Showa Denko K.  
K., Japan). Jpn. Kokai Tokkyo Koho JP 2002197635 A2 20020712, 16 pp.  
(Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-400272 20001228.

AB In the **recording** medium comprising a **nonmagnetic**  
substrate successively **laminated** with a soft magnetic substrate  
film, an orientation-control film, a perpendicular magnetic film, and a  
soft magnetic film, the orientation-control and perpendicular magnetic  
films contain .gtoreq.1 layers with hcp or fcc structure, and the  
uppermost soft magnetic layer is exchange-coupled with the neighboring  
perpendicular magnetic layer. The method involves **lamination** of  
a soft magnetic film on a perpendicular magnetic film. The app. has the  
above **recording** medium and a magnetic head. Fluctuation of  
magnetization at the surface of the perpendicular magnetic film is  
effectively suppressed because of exchange coupling between the magnetic  
film and the neighboring soft magnetic film.

IC ICM G11B005-66

ICS G11B005-65; G11B005-667; G11B005-72; G11B005-738; G11B005-851

CC 77-8 (Magnetic Phenomena)

ST **magnetic recording disk** exchange coupling;  
fluctuation magnetic domain prevention **recording disk**;  
hcp fcc perpendicular **magnetic recording disk**

IT **Magnetic disks**

Magnetic memory devices

(manuf. of **magnetic recording disk** for  
high-d. magnetic input/output app.)

IT 86441-20-5 381243-05-6, Boron 4, chromium 20, cobalt 62, platinum 14  
(atomic)

RL: DEV (Device component use); USES (Uses)

(manuf. of **magnetic recording disk** for  
high-d. magnetic input/output app.)

IT 7440-18-8, Ruthenium, uses 7440-44-0, Carbon, uses 7440-50-8, Copper,  
uses 12780-63-1, Aluminum 50, nickel 50 (atomic) 115457-43-7, Cobalt  
40, zirconium 60 (atomic) **122844-04-6**, Chromium 70, ruthenium 30  
(atomic)

RL: DEV (Device component use); USES (Uses)

- (orientation-control film; manuf. of **magnetic recording disk** for high-d. magnetic input/output app.)
- IT 104193-19-3, Cobalt 89, niobium 7, zirconium 4 (atomic)  
RL: DEV (Device component use); USES (Uses)  
(soft magnetic film; manuf. of **magnetic recording disk** for high-d. magnetic input/output app.)
- IT 122844-04-6, Chromium 70, ruthenium 30 (atomic)  
RL: DEV (Device component use); USES (Uses)  
(orientation-control film; manuf. of **magnetic recording disk** for high-d. magnetic input/output app.)
- L83 ANSWER 5 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
2002:518104 Document No. 137:102827 Magnetic **recording** medium, its manufacture, and magnetic **recording/reproducing** apparatus for it. Shimizu, Kenji; Sakai, Hiroshi (Showa Denko K. K., Japan). Jpn. Kokai Tokkyo Koho JP 2002197643 A2 20020712, 14 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-396074 20001226.
- AB The **recording** medium comprises a **nonmagnetic** substrate on which a soft magnetic undercoat layer, an orientation-controlling film, a magnetic layer with axis of easy magnetization oriented perpendicular to the substrate, and a protective film are formed. In the undercoat layer, part or all of the surface facing to the orientation-controlling film is oxidized, and the oxidized layer has thickness .gtoreq.0.1 and <3 nm. The method for manufg. the **recording** medium involves a process for oxidization of the undercoat layer. The app. using the **recording** medium is also claimed. High-d. **recording** can be achieved by using the **recording** medium.
- IC ICM G11B005-738  
ICS G11B005-65; G11B005-667; G11B005-851
- CC 77-8 (Magnetic Phenomena)
- ST high density magnetic **recording** medium oxidization undercoat layer
- IT Magnetic memory devices  
**Magnetic recording materials**  
Oxidation  
(**magnetic recording** medium with surface-oxidized soft magnetic undercoat layer for high-d. **recording/reproducing**)
- IT Gadolinium alloy, base  
Hafnium alloy, base  
Rhenium alloy, base  
Terbium alloy, base  
Yttrium alloy, base  
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
(orientation-controlling layer; magnetic **recording** medium with surface-oxidized soft magnetic undercoat layer for high-d. **recording/reproducing**)
- IT 7440-05-3, Palladium, processes  
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
(**laminated** with Co, perpendicular magnetic layer; magnetic **recording** medium with surface-oxidized soft magnetic undercoat layer for high-d. **recording/reproducing**)
- IT 7440-48-4, Cobalt, processes  
RL: DEV (Device component use); PEP (Physical, engineering or chemical

process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(**laminate** with Pd, perpendicular magnetic layer; magnetic **recording** medium with surface-oxidized soft magnetic undercoat layer for high-d. **recording**/reproducing)

IT 7440-18-8, Ruthenium, processes 7440-32-6, Titanium, processes 7440-66-6, Zinc, processes 7440-67-7, Zirconium, processes 11114-55-9 12683-48-6 12707-14-1, Aluminum 50, iron 50 (atomic) 12780-63-1, Aluminum 50, nickel 50 (atomic) 12781-95-2 51880-05-8 55891-00-4 104675-01-6, Aluminum 55, nickel 45 (atomic) **136548-17-9**, Aluminum 50, ruthenium 50 (atomic) **434335-58-7**, Carbon 10, ruthenium 90 (atomic) **441332-66-7**, Boron 10, chromium 20, ruthenium 70 (atomic) 441332-67-8, Aluminum 45, boron 10, nickel 45 (atomic)

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(orientation-controlling layer; magnetic **recording** medium with surface-oxidized soft magnetic undercoat layer for high-d. **recording**/reproducing)

IT 94858-24-9 381243-05-6, Boron 4, chromium 20, cobalt 62, platinum 14 (atomic) 441332-68-9, Chromium 17, cobalt 61, platinum 22 (atomic)

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(perpendicular magnetic layer; magnetic **recording** medium with surface-oxidized soft magnetic undercoat layer for high-d. **recording**/reproducing)

IT 60569-79-1, Boron 20, iron 80 (atomic) 104193-19-3, Cobalt 89, niobium 7, zirconium 4 (atomic) 165253-39-4, Carbon 10, iron 80, tantalum 10 (atomic) 441332-61-2, Cobalt 89, niobium 5, zirconium 6 (atomic) 441332-62-3, Cobalt 89, niobium 3, yttrium 8 (atomic) 441332-63-4, Hafnium 10, iron 75, oxygen 15 (atomic) 441332-64-5, Iron 70, nitrogen 15, tantalum 15 (atomic) 441332-65-6, Iron 70, oxygen 15, zirconium 15 (atomic)

RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(undercoat layer; magnetic **recording** medium with surface-oxidized soft magnetic undercoat layer for high-d. **recording**/reproducing)

IT **136548-17-9**, Aluminum 50, ruthenium 50 (atomic) **434335-58-7**, Carbon 10, ruthenium 90 (atomic) **441332-66-7**, Boron 10, chromium 20, ruthenium 70 (atomic)

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(orientation-controlling layer; magnetic **recording** medium with surface-oxidized soft magnetic undercoat layer for high-d. **recording**/reproducing)

L83 ANSWER 6 OF 23 HCAPLUS COPYRIGHT 2002 ACS

2002:409151 Document No. 136:410476 Longitudinal magnetic **recording** medium and magnetic **recording** apparatus with high

**recording** density, suppressed noise and improved stability.

Kanbe, Tetsuya; Yahisa, Yotsuo; Matsuda, Yoshibumi; Inagaki, Jo; Sakamoto, Koji (Japan). U.S. Pat. Appl. Publ. US 2002064691 A1 20020530, 19 pp.

(English). CODEN: USXXCO. APPLICATION: US 2001-888523 20010626.

PRIORITY: JP 2000-313120 20001006; JP 2000-381692 20001211.

AB The title longitudinal magnetic **recording** medium includes a

**nonmagnetic** substrate, a 1st underlayer having at least one of an amorphous structure and a fine crystal structure formed on the **nonmagnetic** substrate, a 2nd underlayer having a bcc. structure formed on the 1st underlayer, a 3rd underlayer having a hexagonal closed packed structure formed on the 2nd underlayer, and a magnetic layer having the hexagonal closed packed structure formed on the 3rd underlayer, wherein the 3rd underlayer is composed of an alloy contg. Co and Ru.

IC ICM G11B005-66

NCL 428694000TS

CC 77-8 (Magnetic Phenomena)

Section cross-reference(s): 56

ST cobalt ruthenium alloy magnetic **recording**

IT Crystal structure types

(bcc.; longitudinal magnetic **recording** medium and magnetic **recording** app. with high **recording** d., suppressed noise and improved stability)

IT Crystal structure types

(hexagonal, closed packed; longitudinal magnetic **recording** medium and magnetic **recording** app. with high **recording** d., suppressed noise and improved stability)

IT Magnetic films

(longitudinal magnetic **recording** medium and magnetic **recording** app. with high **recording** d., suppressed noise and improved stability)

IT **94470-28-7**, Cobalt 60, ruthenium 40 (atomic) 353474-74-5, Boron 8, chromium 20, cobalt 58, platinum 14 (atomic) 381243-05-6, Boron 4, chromium 20, cobalt 62, platinum 14 (atomic) 412942-18-8, Chromium 40, nickel 52, zirconium 8 (atomic) 412942-33-7, Boron 6, chromium 20, cobalt 60, platinum 14 (atomic) 412942-34-8, Boron 8, chromium 18, cobalt 58, platinum 16 (atomic) 412942-36-0, Boron 6, chromium 18, cobalt 62, platinum 14 (atomic) 412942-38-2, Boron 8, chromium 20, cobalt 56, platinum 16 (atomic)

RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(longitudinal magnetic **recording** medium and magnetic **recording** app. with high **recording** d., suppressed noise and improved stability)

IT 52360-02-8, Nickel 62, tantalum 38 (atomic) **77592-17-7**, Cobalt 50, ruthenium 50 (atomic) **120171-63-3**, Cobalt 30, ruthenium 70 (atomic) **153084-87-8**, Cobalt 70, ruthenium 30 (atomic) **273379-93-4**, Cobalt 65, ruthenium 35 (atomic) 412942-08-6, Chromium 32, cobalt 62, zirconium 6 (atomic) 412942-10-0, Chromium 36, cobalt 56, tantalum 8 (atomic) 412942-11-1, Chromium 34, cobalt 41, tungsten 25 (atomic) 412942-12-2, Cobalt 54, titanium 6, vanadium 40 (atomic) 412942-13-3, Boron 8, cobalt 52, vanadium 40 (atomic) 412942-14-4, Cobalt 38, silicon 12, vanadium 50 (atomic) 412942-15-5, Cobalt 35, manganese 45, niobium 20 (atomic) 412942-16-6, Cobalt 30, manganese 45, molybdenum 25 (atomic) 412942-17-7, Nickel 45, tungsten 55 (atomic) 412942-19-9, Chromium 40, nickel 48, titanium 12 (atomic) 412942-20-2, Boron 15, nickel 35, vanadium 50 (atomic) 412942-21-3, Nickel 30, silicon 15, vanadium 55 (atomic) 412942-22-4, Molybdenum 30, nickel 32, vanadium 38 (atomic) **412942-25-7**, Cobalt 40, ruthenium 60 (atomic) **412942-26-8**, Boron 1, cobalt 59, ruthenium 40 (atomic) **412942-27-9**, Boron 3, cobalt 57, ruthenium 40 (atomic) **412942-28-0**, Boron 6, cobalt 54, ruthenium 40 (atomic) **412942-29-1**, Boron 12, cobalt 48, ruthenium 40 (atomic) **412942-30-4**, Boron 15, cobalt 45, ruthenium 40 (atomic) 431898-42-9, Cobalt 70, molybdenum 10, titanium 20 (atomic) 431898-43-0, Cobalt 70, titanium 20, tungsten 10 (atomic) 431898-44-1, Cobalt 75,

molybdenum 5, titanium 20 (atomic) 431898-45-2, Boron 3, cobalt 72,  
molybdenum 5, titanium 20 (atomic) 431898-46-3, Boron 3, cobalt 77,  
molybdenum 5, titanium 15 (atomic)  
RL: PRP (Properties); TEM (Technical or engineered material use); USES  
(Uses)

(longitudinal magnetic **recording** medium and magnetic  
**recording** app. with high **recording** d., suppressed  
noise and improved stability)

IT 12735-25-0 207224-28-0, Chromium 10, cobalt 60, zirconium 10 (atomic)  
342384-06-9, Chromium 20, nickel 65, zirconium 15 (atomic)  
**431898-47-4**, Cobalt 40-65, ruthenium 35-60 (atomic) 431898-48-5,  
Boron, cobalt, ruthenium **431898-49-6**, Cobalt bal., ruthenium  
35-60, boron 1-12 (atomic) 431898-50-9, Cobalt bal., chromium 16-22,  
platinum 12-18, boron 4-12, tantalum 0-3 (atomic)

RL: TEM (Technical or engineered material use); USES (Uses)

(longitudinal magnetic **recording** medium and magnetic  
**recording** app. with high **recording** d., suppressed  
noise and improved stability)

IT **94470-28-7**, Cobalt 60, ruthenium 40 (atomic)

RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP  
(Physical process); TEM (Technical or engineered material use); PROC  
(Process); USES (Uses)

(longitudinal magnetic **recording** medium and magnetic  
**recording** app. with high **recording** d., suppressed  
noise and improved stability)

IT **77592-17-7**, Cobalt 50, ruthenium 50 (atomic) **120171-63-3**  
, Cobalt 30, ruthenium 70 (atomic) **153084-87-8**, Cobalt 70,  
ruthenium 30 (atomic) **273379-93-4**, Cobalt 65, ruthenium 35  
(atomic) **412942-25-7**, Cobalt 40, ruthenium 60 (atomic)  
**412942-26-8**, Boron 1, cobalt 59, ruthenium 40 (atomic)  
**412942-27-9**, Boron 3, cobalt 57, ruthenium 40 (atomic)  
**412942-28-0**, Boron 6, cobalt 54, ruthenium 40 (atomic)  
**412942-29-1**, Boron 12, cobalt 48, ruthenium 40 (atomic)  
**412942-30-4**, Boron 15, cobalt 45, ruthenium 40 (atomic)

RL: PRP (Properties); TEM (Technical or engineered material use); USES  
(Uses)

(longitudinal magnetic **recording** medium and magnetic  
**recording** app. with high **recording** d., suppressed  
noise and improved stability)

IT **431898-47-4**, Cobalt 40-65, ruthenium 35-60 (atomic)  
**431898-49-6**, Cobalt bal., ruthenium 35-60, boron 1-12 (atomic)

RL: TEM (Technical or engineered material use); USES (Uses)

(longitudinal magnetic **recording** medium and magnetic  
**recording** app. with high **recording** d., suppressed  
noise and improved stability)

L83 ANSWER 7 OF 23 HCAPLUS COPYRIGHT 2002 ACS

2002:345865 Document No. 136:362831 Magnetic **recording** medium for  
high density **recording**. Futamoto, Masaaki; Inaba, Nobuyuki;  
Hirayama, Yoshiyuki; Takeuchi, Teruaki; Honda, Yukio (Hitachi Ltd.,  
Japan). U.S. US 6383667 B1 20020507, 20 pp. (English). CODEN: USXXAM.  
APPLICATION: US 1999-413813 19991007. PRIORITY: JP 1998-288134 19981009;  
JP 1999-45884 19990224.

AB The present invention relates to a magnetic **recording** medium  
that has a magnetic film suitable for high-d. magnetic **recording**  
. The magnetic **recording** medium includes a substrate, an  
underlayer provided on the substrate, a Co alloy magnetic film formed  
through the underlayer, and a protective film for protecting the magnetic  
film, in which the underlayer has a 2-layer structure of an lower  
underlayer contacted with the substrate and an upper underlayer contacted

with the Co alloy magnetic film, the upper underlayer is a Co-Crx-My alloy film having a hcp. structure, where 25 at.%  $\leq x+y \leq 50$  at.%, 0.5 at.%  $\leq y$ , and **non-magnetic** element M is selected from the group of elements B, Si, Ge, C, Al, P, Ti, V, Nb, Zr, Hf, Mn, Rh, Os, Ir, Re, Pd, Pt, Mo, Ta, W, Ag and Au. Thereby the medium can be increased in its coercive force and can be improved in its thermal stability characteristics.

- IC ICM G11B005-66  
ICS G11B005-70
- NCL 428694000TS
- CC 77-8 (Magnetic Phenomena)  
Section cross-reference(s): 56
- ST chromium cobalt alloy magnetic **recording** medium
- IT Coercive force (magnetic)  
Thermal stability  
(improvement of; magnetic **recording** medium for high d. **recording**)
- IT Magnetic films  
**Magnetic recording materials**  
(magnetic **recording** medium for high d. **recording**)
- IT 1314-23-4, Zirconia, uses 7440-03-1, Niobium, uses 7440-21-3, Silicon, uses 7440-32-6, Titanium, uses 7440-47-3, Chromium, uses 7440-58-6, Hafnium, uses 7440-67-7, Zirconium, uses 7631-86-9, Silica, uses 12381-52-1, Chromium silicide (CrSi<sub>3</sub>) 12797-58-9  
RL: TEM (Technical or engineered material use); USES (Uses)  
(adhesion layer; magnetic **recording** medium for high d. **recording**)
- IT 197803-58-0 421550-46-1 421550-47-2 421550-48-3 421550-49-4  
421550-50-7 421550-51-8 421550-52-9 421550-53-0 421550-54-1  
421550-55-2 421550-56-3 421550-57-4 421550-58-5 421550-61-0  
421550-64-3 421550-67-6 421550-68-7 421550-69-8 421550-70-1  
RL: TEM (Technical or engineered material use); USES (Uses)  
(film **material**; magnetic **recording** medium for high d. **recording**)
- IT 1309-48-4, Magnesium oxide (MgO), uses 7789-24-4, Lithium fluoride (LiF), uses 11114-55-9 11114-60-6 11114-68-4 11143-56-9  
11147-86-7 12682-24-5 39286-82-3 39314-47-1 39460-27-0  
51614-60-9 59124-11-7 **77592-17-7**, Cobalt 50, ruthenium 50 (atomic) **94470-28-7**, Cobalt 60, ruthenium 40 (atomic)  
147099-05-6, Cobalt 90, ruthenium 10 (atomic) **153084-87-8**  
**160619-62-5**, Cobalt 80, ruthenium 20 (atomic) **273379-93-4**, Cobalt 65, ruthenium 35 (atomic) **341036-30-4**  
**366476-02-0** **412942-25-7** **421550-72-3**  
**421550-73-4** **421550-74-5** 421550-75-6  
**421550-76-7** **421550-77-8** **421550-78-9**  
**421550-79-0** **421550-80-3** **421550-81-4**  
421550-82-5 **421550-83-6** 421550-84-7 **421550-85-8**  
**421550-86-9** 421550-87-0 **421550-88-1** 421550-89-2  
**421550-90-5**  
RL: TEM (Technical or engineered material use); USES (Uses)  
(lower underlayer; magnetic **recording** medium for high d. **recording**)
- IT 96439-26-8 213332-70-8, Chromium 30, cobalt 66, titanium 4 (atomic)  
323187-06-0, Chromium 30, cobalt 60, manganese 10 (atomic) 421550-28-9  
421550-29-0 421550-30-3 421550-31-4 421550-32-5 421550-33-6  
421550-34-7 421550-35-8 421550-36-9 421550-37-0 421550-39-2  
421550-40-5 421550-41-6 421550-42-7 421550-43-8 421550-44-9  
421550-45-0  
RL: TEM (Technical or engineered material use); USES (Uses)

- (magnetic **recording** medium for high d. **recording**)
- IT 294626-73-6, Boron 6, chromium 25, cobalt 69 (atomic) 294626-75-8, Chromium 25, cobalt 67, silicon 8 (atomic) 294626-77-0, Chromium 25, cobalt 65, germanium 10 (atomic) 294626-79-2, Aluminum 4, chromium 25, cobalt 71 (atomic) 294626-81-6, Chromium 25, cobalt 69, phosphorus 6 (atomic) 294626-83-8, Chromium 25, cobalt 69, titanium 6 (atomic) 294626-85-0, Chromium 25, cobalt 65, vanadium 10 (atomic) 294626-87-2, Chromium 25, cobalt 71, zirconium 4 (atomic) 294626-89-4, Chromium 25, cobalt 67, niobium 8 (atomic) 294626-91-8, Chromium 25, cobalt 69, hafnium 6 (atomic) 294626-93-0, Chromium 25, cobalt 65, manganese 10 (atomic) 294626-95-2, Chromium 25, cobalt 63, rhodium 12 (atomic) 294626-97-4, Chromium 25, cobalt 57, iridium 18 (atomic) 294626-99-6, Chromium 25, cobalt 61, rhenium 14 (atomic) 294627-01-3, Chromium 25, cobalt 67, palladium 8 (atomic) 294627-03-5, Chromium 25, cobalt 69, platinum 6 (atomic) 294627-05-7, Chromium 25, cobalt 71, molybdenum 4 (atomic) 294627-07-9, Chromium 25, cobalt 67, tungsten 8 (atomic) 294627-09-1, Chromium 25, cobalt 71, silver 4 (atomic) 294627-11-5, Chromium 25, cobalt 69, gold 6 (atomic)
- RL: TEM (Technical or engineered material use); USES (Uses)  
(upper underlayer; magnetic **recording** medium for high d. **recording**)
- IT 77592-17-7, Cobalt 50, ruthenium 50 (atomic) 94470-28-7, Cobalt 60, ruthenium 40 (atomic) 153084-87-8 160619-62-5, Cobalt 80, ruthenium 20 (atomic) 273379-93-4, Cobalt 65, ruthenium 35 (atomic) 341036-30-4 366476-02-0  
412942-25-7 421550-72-3 421550-73-4  
421550-74-5 421550-76-7 421550-77-8  
421550-78-9 421550-79-0 421550-80-3  
421550-81-4 421550-83-6 421550-85-8  
421550-86-9 421550-88-1 421550-90-5
- RL: TEM (Technical or engineered material use); USES (Uses)  
(lower underlayer; magnetic **recording** medium for high d. **recording**)
- L83. ANSWER 8 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
2002:292134 Document No. 136:334092 Magnetic **recording** medium and magnetic memory device. Kamibe, Tetsuya; Yaku, Hiroo; Matsuda, Yoshifumi; Inagaki, Yuzuru; Sakamoto, Koji (Hitachi Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2002117531 A2 20020419, 10 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-313120 20001006.
- AB A low-noise and stable magnetic **recording** medium comprises a **non-magnetic** substrate, an amorphous or micro-cryst. first underlayer, a second underlayer having a body-centered cubic structure, a Co-Ru alloy third underlayer having a hexagonal dense structure, and a magnetic layer on the third underlayer. Addnl., the third underlayer may contain B. A magnetic memory device having the above medium is also described.
- IC ICM G11B005-738  
ICS C23C014-06; G11B005-65; H01F010-30
- CC 77-8 (Magnetic Phenomena)
- ST magnetic **recording** app cobalt ruthenium alloy underlayer
- IT Magnetic memory devices  
(Co-Ru alloy underlayer in magnetic **recording** medium and magnetic memory device)
- IT 273379-93-4  
RL: DEV (Device component use); USES (Uses)  
(CCo-Ru alloy underlayer in magnetic **recording** medium and magnetic memory device)
- IT 7440-47-3, Chromium, uses 12735-25-0 77592-17-7 79665-67-1  
94470-28-7 108801-62-3 109375-39-5 110431-79-3



120171-63-3 153084-87-8 153929-41-0 153929-42-1  
 167498-56-8 308356-82-3 353474-74-5 412942-08-6 412942-09-7  
 412942-10-0 412942-11-1 412942-12-2 412942-13-3 412942-14-4  
 412942-15-5 412942-16-6 412942-17-7 412942-18-8 412942-19-9  
 412942-20-2 412942-21-3 412942-22-4 412942-24-6 412942-25-7  
 412942-26-8 412942-27-9 412942-28-0  
 412942-29-1 412942-30-4 412942-31-5 412942-32-6  
 412942-33-7 412942-34-8 412942-36-0 412942-37-1 412942-38-2  
 412942-39-3 412942-40-6

RL: DEV (Device component use); USES (Uses)

(Co-Ru alloy underlayer in magnetic **recording** medium and magnetic memory device)

IT 273379-93-4

RL: DEV (Device component use); USES (Uses)

(CCo-Ru alloy underlayer in magnetic **recording** medium and magnetic memory device)

IT 77592-17-7 94470-28-7 120171-63-3

153084-87-8 412942-25-7 412942-26-8

412942-27-9 412942-28-0 412942-29-1

412942-30-4 412942-40-6

RL: DEV (Device component use); USES (Uses)

(Co-Ru alloy underlayer in magnetic **recording** medium and magnetic memory device)

L83 ANSWER 9 OF 23 HCAPLUS COPYRIGHT 2002 ACS

2002:292133 Document No. 136:334091 Magnetic **recording** medium.

Inaba, Nobuyuki; Kirino, Fumiyoshi; Kanda, Tetsunori; Matsunuma, Satoru; Mizumura, Tetsuo; Takeuchi, Teruaki (Hitachi Maxell Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2002117530 A2 20020419, 13 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-308930 20001010.

AB A high-d. magnetic **recording** medium comprises a non-

magnetic substrate, .gtoreq.2 underlayers, .gtoreq.1 of which is formed by ECR sputtering, on the substrate, and a magnetic layer on the underlayers. Specifically, the underlayers may comprise MgO, a Ni-Al 2-component alloy, Ni-Al 3-component alloy, Cr, or Cr alloy contg. V, Mo, W, Nb, Ti, Ta, Ru, Zr, and/or Hf.

IC ICM G11B005-738

ICS C23C014-06; C23C014-34; G11B005-65; G11B005-851; H01F010-26; H01F010-30; H01F041-18

CC 77-8 (Magnetic Phenomena)

ST magnetic **recording** app sputter deposited film

IT Magnetic memory devices

(sputter deposited underlayer in magnetic **recording** medium)

IT Films

(sputter-deposited; sputter deposited underlayer in magnetic **recording** medium)

IT Chromium alloy, base

RL: DEV (Device component use); USES (Uses)

(sputter deposited underlayer in magnetic **recording** medium)

IT 1309-48-4; Magnesium oxide (MgO), uses 7440-47-3, Chromium, uses

11114-68-4 12682-24-5 174321-15-4, Chromium 85, titanium 15 (atomic)

177408-82-1, Chromium 19, cobalt 68, platinum 13 (atomic) 321863-03-0

342386-46-3, Chromium 25, cobalt 55, ruthenium 20 (atomic)

412931-57-8 412931-58-9 412931-59-0

RL: DEV (Device component use); USES (Uses)

(sputter deposited underlayer in magnetic **recording** medium)

IT 342386-46-3, Chromium 25, cobalt 55, ruthenium 20 (atomic)

RL: DEV (Device component use); USES (Uses)

(sputter deposited underlayer in magnetic **recording** medium)

L83 ANSWER 10 OF 23 HCAPLUS COPYRIGHT 2002 ACS

2002:292132 Document No. 136:334090 Magnetic **recording** medium.

Inaba, Nobuyuki; Kirino, Fumiyoshi; Matsunuma, Satoru; Kanda, Tetsunori; Mizumura, Tetsuo; Takeuchi, Teruaki (Hitachi Maxell Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2002117529 A2 20020419, 13 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-308866 20001010.

AB A high-d. magnetic **recording** medium having a low S/

**N ratio** comprises a ferromagnetic **layer** on a **non-magnetic** substrate, first, second, and third successive underlayers on the ferromagnetic **layer**, and a magnetic **recording layer** on the underlayers.

Specifically, the ferromagnetic **layer** may comprise a Co alloy contg. .gtoreq. 1 of Pt, Pd, Rh, B, Si, Cr, Ru, Zr, Ta, Nb, and V, particles of Co, Fe, and/or Ni oxide(s) surrounded with Si oxide, Ti oxide, Zn oxide, and/or Ta oxide, or .gtoreq. 2 of Co, Ni, Si, Al, Ta, Ti, Zr, Nb, and Fe. Optionally, the underlayers and **recording layer** may comprise an epitaxial **film**.

IC ICM G11B005-738

ICS C23C014-06; G11B005-65; G11B005-66; G11B005-851; H01F010-16; H01F010-18; H01F010-30

CC 77-8 (Magnetic Phenomena)

ST magnetic **recording** app ferromagnetic epitaxial **film**

IT Epitaxial **films**

Ferromagnetic **films**

Magnetic memory devices

(ferromagnetic **film** and underlayers in magnetic **recording** medium)

IT Cobalt alloy, base

RL: DEV (Device component use); USES (Uses)

(ferromagnetic **film** and underlayers in magnetic **recording** medium)

IT 1313-99-1, Nickel oxide, uses 1314-13-2, Zinc oxide, uses 1314-61-0, Tantalum oxide 1332-37-2, Iron oxide, uses 7631-86-9, Silica, uses 11104-61-3, Cobalt oxide 11114-68-4 12682-24-5 13463-67-7, Titanium oxide, uses 142295-96-3 174321-15-4, Chromium 85, titanium 15 (atomic) 177408-82-1, Chromium 19, cobalt 68, platinum 13 (atomic) 212334-78-6, Chromium 19, cobalt 69, platinum 12 (atomic) 321863-03-0 **342386-46-3**, Chromium 25, cobalt 55, ruthenium 20 (atomic) 412927-91-4

RL: DEV (Device component use); USES (Uses)

(ferromagnetic **film** and underlayers in magnetic **recording** medium)

IT **342386-46-3**, Chromium 25, cobalt 55, ruthenium 20 (atomic)

RL: DEV (Device component use); USES (Uses)

(ferromagnetic **film** and underlayers in magnetic **recording** medium)

L83 ANSWER 11 OF 23 HCAPLUS COPYRIGHT 2002 ACS

2002:104762 Document No. 136:160200 Perpendicular magnetic **recording** medium and apparatus for reproducing of **recorded** information.

Nakamura, Futoshi; Hikosaka, Kazushi; Oikawa, Soichi (Toshiba Corp., Japan). Jpn. Kokai Tokkyo Koho JP 2002042318 A2 20020208, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-219447 20000719.

AB The medium has a **nonmagnetic** support, a soft magnetic layer

comprising alternately **laminated** .ltoreq.500-.ANG. soft magnetic layers and **nonmagnetic** layers on the support, and a perpendicular magnetic **recording** layer on the **laminated** layer. A **laminate** of a **nonmagnetic** substrate, a

**nonmagnetic** thin intermediate layer, and a Fe-Al-Si alloy soft

magnetic layer is also claimed. The app. has the above medium, a means of

supporting and driving of rotation of the medium, a device for **recording** on the medium, a magnetic head for reprodn. of the **recorded** information, and a carriage assembly that supports the head and allows free movement of the head against the **recording** medium. The medium allows high-d. **recording** with low noise.

IC ICM G11B005-667

ICS G11B005-64; G11B005-738; H01F010-14; H01F010-16; H01F010-30  
CC 77-8 (Magnetic Phenomena)

Section cross-reference(s): 56

ST perpendicular magnetic **recording** medium; magnetic **recording** reproducing head low noise; thin soft magnetic layer **laminate**

IT **Magnetic recording materials**

(perpendicular **magnetic recording** medium having **laminate** of soft thin magnetic layers and **nonmagnetic** layers)

IT Magnetic memory devices

(perpendicular magnetic **recording** medium having **laminate** of soft thin magnetic layers and **nonmagnetic** layers in)

IT 7440-44-0, Carbon, uses 93511-57-0

RL: TEM (Technical or engineered material use); USES (Uses)  
(**nonmagnetic** layer; in perpendicular magnetic **recording** medium having **laminate** of soft thin magnetic layers and **nonmagnetic** layers)

IT 189817-15-0, Chromium cobalt platinum oxide

RL: TEM (Technical or engineered material use); USES (Uses)  
(**recording** layer; perpendicular magnetic **recording** medium having **laminate** of soft thin magnetic layers and **nonmagnetic** layers)

IT 11122-26-2

RL: TEM (Technical or engineered material use); USES (Uses)  
(soft magnetic layer; perpendicular magnetic **recording** medium having **laminate** of soft thin magnetic layers and **nonmagnetic** layers)

IT **394208-53-8**, Aluminum 11, carbon 0-17, chromium 16, cobalt 0-17, iron bal., platinum 20, ruthenium 0-17, silicon 0-17, titanium 0-17 (atomic)

RL: TEM (Technical or engineered material use); USES (Uses)  
(sputtering target; for prepn. of perpendicular magnetic **recording** medium having **laminate** of soft thin magnetic layers and **nonmagnetic** layers)

IT **394208-53-8**, Aluminum 11, carbon 0-17, chromium 16, cobalt 0-17, iron bal., platinum 20, ruthenium 0-17, silicon 0-17, titanium 0-17 (atomic)

RL: TEM (Technical or engineered material use); USES (Uses)  
(sputtering target; for prepn. of perpendicular magnetic **recording** medium having **laminate** of soft thin magnetic layers and **nonmagnetic** layers)

L83 ANSWER 12 OF 23 HCAPLUS COPYRIGHT 2002 ACS

2001:745602 Document No. 135:297466 Perpendicular magnetic **recording** medium involving ruthenium alloy underlayer and magnetic **recording** apparatus. Oikawa, Soichi; Hikosaka, Kazushi (Toshiba Corp., Japan). Jpn. Kokai Tokkyo Koho JP 2001283428 A2 20011012, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-94552 20000330.

AB The **recording** medium has a **nonmagnetic** support, an underlayer on the support, a magnetic layer on the underlayer, and a protective layer on the magnetic layer wherein the magnetic layer is made of a Co-based alloy and the underlayer is made of an alloy based on

.gtoreq.60 at.% Ru and a body-centered cubic material. Alternatively, the medium involves a double layer underlayer comprising a Ti (alloy or compd.) layer and the Ru alloy layer. The **recording** medium shows reduced noise. The **recording** app. involves the magnetic **recording** medium, a means of supporting of the medium and of driving rotation of the medium, a means of **recording** information on the medium and of reproducing information from the medium, and a means of supporting the **recording** means.

- IC ICM G11B005-738  
ICS G11B005-64; G11B005-66  
CC 77-8 (Magnetic Phenomena)  
Section cross-reference(s): 56  
ST perpendicular magnetic **recording** medium underlayer; cobalt alloy magnetic **recording** medium; ruthenium alloy underlayer magnetic **recording** medium; bcc material alloy; noise reduced magnetic **recording** medium app  
IT **Magnetic disks**  
Magnetic memory devices  
(perpendicular **magnetic recording** medium involving ruthenium alloy underlayer with reduced noise for magnetic **recording** app.)  
IT Magnetic materials  
(soft; in perpendicular magnetic **recording** medium involving ruthenium alloy underlayer with reduced noise for magnetic **recording** app.)  
IT Glass, uses  
RL: DEV (Device component use); USES (Uses)  
(support; in perpendicular magnetic **recording** medium involving ruthenium alloy underlayer with reduced noise for magnetic **recording** app.)  
IT 93511-57-0  
RL: DEV (Device component use); USES (Uses)  
(intermediate layer; in perpendicular magnetic **recording** medium involving ruthenium alloy underlayer with reduced noise for magnetic **recording** app.)  
IT 189817-15-0, Chromium cobalt platinum oxide  
RL: DEV (Device component use); USES (Uses)  
(magnetic; perpendicular magnetic **recording** medium involving ruthenium alloy underlayer with reduced noise for magnetic **recording** app.)  
IT **365403-56-1 365403-57-2**  
RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(sputtering target; for prepn. of perpendicular magnetic **recording** medium involving ruthenium alloy underlayer with reduced noise)  
IT 7440-32-6, Titanium, uses 25583-20-4, Titanium nitride 59124-09-3  
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)  
(underlayer; perpendicular magnetic **recording** medium involving ruthenium alloy underlayer with reduced noise for magnetic **recording** app.)  
IT **365403-56-1 365403-57-2**  
RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(sputtering target; for prepn. of perpendicular magnetic **recording** medium involving ruthenium alloy underlayer with reduced noise)

L83 ANSWER 13 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
2001:635676 Document No. 135:204301 Durable magnetic **recording**  
media possessing chromium alloy-based **nonmagnetic** underlayers

- and their manufacture. Uesumi, Hiroyuki; Oikawa, Tadaaki (Fuji Electric Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2001236636 A2 20010831, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-46472 20000223.
- AB The media, esp. suited for external memory devices of computers, comprise plastic supports, Cr alloy-based **nonmagnetic** underlayers, Co-based **recording** layers, protective layers, and liq. lubricant layers, where the Cr alloys contain (i) .gtoreq.15 at.% Zr, Nb, Mo, Ru, and/or Pd or (ii) .gtoreq.10 at.% Hf, Ta, W, Re, Pt, and/or Au and show bcc crystal structure. The underlayers are manufd. by sputtering under .ltoreq.30 (suitably .ltoreq.15) mTorr gas pressure. The media suppressed elution of Co to the surfaces and showed excellent wear resistance.
- IC ICM G11B005-738  
ICS C23C014-34; G11B005-64; G11B005-851
- CC 77-8 (Magnetic Phenomena)  
Section cross-reference(s): 56
- ST magnetic **recording** medium chromium alloy underlayer; bcc structured chromium alloy magnetic medium; sputtering chromium alloy underlayer magnetic media; cobalt elution suppression magnetic memory device
- IT Crystal structure types  
(bcc.; durable magnetic **recording** media possessing bcc-structured sp. Cr alloy underlayers for computer memory devices)
- IT Magnetic memory devices  
**Magnetic recording materials**  
Sputtering  
(durable magnetic **recording** media possessing bcc-structured sp. Cr alloy underlayers for computer memory devices)
- IT Polyethers, processes  
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(perfluoro, outermost lubricant layers; durable magnetic **recording** media possessing bcc-structured sp. Cr alloy underlayers for computer memory devices)
- IT Fluoropolymers, processes  
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(polyether-, outermost lubricant layers; durable magnetic **recording** media possessing bcc-structured sp. Cr alloy underlayers for computer memory devices)
- IT Polycarbonates, properties  
RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(supports; durable magnetic **recording** media possessing bcc-structured sp. Cr alloy underlayers for computer memory devices)
- IT 7440-44-0, Carbon, processes  
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(protective layers; durable magnetic **recording** media possessing bcc-structured sp. Cr alloy underlayers for computer memory devices)
- IT 356057-03-9  
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(**recording** layers; durable magnetic **recording** media possessing bcc-structured sp. Cr alloy underlayers for computer memory devices)
- IT 119036-83-8 **123590-45-4**, Chromium 85, ruthenium 15 (atomic)  
124798-68-1, Chromium 85, molybdenum 15 (atomic) 124798-69-2, Chromium 75, molybdenum 25 (atomic) 207224-36-0, Chromium 85, zirconium 15 (atomic) 225798-98-1, Chromium 90, tungsten 10 (atomic) 241826-25-5, Chromium 90, tantalum 10 (atomic) 356056-98-9 356056-99-0

- 356057-00-6 356057-01-7 356057-02-8  
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)  
(underlayers; durable magnetic **recording** media possessing  
bcc-structured sp. Cr alloy underlayers for computer memory devices)
- IT **123590-45-4**, Chromium 85, ruthenium 15 (atomic)  
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)  
(underlayers; durable magnetic **recording** media possessing  
bcc-structured sp. Cr alloy underlayers for computer memory devices)
- L83 ANSWER 14 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
2001:589414 Document No. 135:326347 Improvement of initial growth  
**layer** in CoCr-alloy thin **film** media. Futamoto, M.;  
Hirayama, Y.; Honda, Y.; Inaba, N. (Central Research Laboratory, Hitachi  
Ltd., Kokubunji, Tokyo, 185-8601, Japan). Journal of Magnetism and  
Magnetic Materials, 226-230 (Pt. 2), 1610-1612 (English) 2001. CODEN:  
JMMMD. ISSN: 0304-8853. Publisher: Elsevier Science B.V..
- AB Introduction of **nonmagnetic** hcp. CoCrRu **layer** between  
hcp. CoCr alloy **recording layer** and a hcp. or a bcc.  
underlayer improves the crystallog. quality of initial growth region.  
Magnetic properties are improved by realizing good heteroepitaxy between  
the **nonmagnetic** and the magnetic hcp. **layers**.
- CC 77-1 (Magnetic Phenomena)  
Section cross-reference(s): 75
- ST cobalt chromium **magnetic recording material**  
initial growth **layer**
- IT **Coercive** force (magnetic)  
**Magnetic recording materials**  
Microstructure  
(CoCr22Ru25 initial growth **layer** improvement in  
CoCr19Pt10-alloy thin **film** magnetic **recording**  
media)
- IT 177726-90-8, Chromium 19, cobalt 71, platinum 10 (atomic)  
**341036-31-5**, Chromium 25, cobalt 50, ruthenium 25 (atomic)  
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM  
(Technical or engineered material use); PROC (Process); USES (Uses)  
(CoCr22Ru25 initial growth **layer** improvement in  
CoCr19Pt10-alloy thin **film** magnetic **recording**  
media)
- IT 12782-62-6, Chromium 10, titanium 90 (atomic)  
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM  
(Technical or engineered material use); PROC (Process); USES (Uses)  
(CoCr22Ru25 initial growth **layer** improvement in  
CoCr19Pt10-alloy thin **film** magnetic **recording** media  
also contg.)
- IT **341036-31-5**, Chromium 25, cobalt 50, ruthenium 25 (atomic)  
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM  
(Technical or engineered material use); PROC (Process); USES (Uses)  
(CoCr22Ru25 initial growth **layer** improvement in  
CoCr19Pt10-alloy thin **film** magnetic **recording**  
media)
- L83 ANSWER 15 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
2001:582269 Document No. 135:146136 High output spin-valve thin-film  
magnetic **recording** head with reduced asymmetry and no side  
reading for narrow track widths and method for making the same. Hasegawa,  
Naoya; Honda, Kenji; Kakihara, Yoshihiko (Alps Electric Co., Ltd., Japan).  
U.S. Pat. Appl. Publ. US 20010012188 A1 20010809, 58 pp. (English).  
CODEN: USXXCO. APPLICATION: US 2001-774781 20010130. PRIORITY: JP

2000-25659 20000202.

- AB A spin-valve thin-film magnetic element includes a substrate, a composite formed thereon, and electrode layers formed on both sides of the composite. The composite includes an antiferromagnetic layer, a pinned magnetic layer, a **nonmagnetic** conductive layer, a free magnetic layer, a mean-free-path-extending layer, and an exchange bias layer. The mean-free-path-extending layer may be a back layer or a mirror reflective layer. The mean-free-path-extending layer extends the mean free path of spin-up conduction electrons in the spin-valve thin-film magnetic element. This spin-valve thin-film magnetic element meets trends toward a narrower track width.
- IC ICM G11B005-39  
ICS G11B005-127
- NCL 360324120
- CC 77-8 (Magnetic Phenomena)  
Section cross-reference(s): 56
- ST spin valve **recording** head manganese alloy
- IT Films  
(antiferromagnetic; high output spin-valve thin-film magnetic **recording** head with reduced asymmetry and no side reading for narrow track widths and method for making same)
- IT Films  
(elec. conductive; high output spin-valve thin-film magnetic **recording** head with reduced asymmetry and no side reading for narrow track widths and method for making same)
- IT Antiferromagnetic materials  
Electric conductors  
(films; high output spin-valve thin-film magnetic **recording** head with reduced asymmetry and no side reading for narrow track widths and method for making same)
- IT Annealing  
Electrodes  
Magnetic films  
Magnetic **recording** heads  
Spin valves  
(high output spin-valve thin-film magnetic **recording** head with reduced asymmetry and no side reading for narrow track widths and method for making same)
- IT Iridium alloy, base  
Osmium alloy, base  
Palladium alloy, base  
Platinum alloy, base  
Rhodium alloy, base  
Ruthenium alloy, base  
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
(high output spin-valve thin-film magnetic **recording** head with reduced asymmetry and no side reading for narrow track widths and method for making same)
- IT 7439-90-9, Krypton, uses 7440-01-9, Neon, uses 7440-02-0, Nickel, uses 7440-37-1, Argon, uses 7440-47-3, Chromium, uses 7440-63-3, Xenon, uses  
RL: MOA (Modifier or additive use); USES (Uses)  
(high output spin-valve thin-film magnetic **recording** head with reduced asymmetry and no side reading for narrow track widths and method for making same)
- IT 1344-28-1, Alumina, processes 7439-88-5, Iridium, processes 7440-04-2, Osmium, processes 7440-05-3, Palladium, processes 7440-06-4, Platinum, processes 7440-16-6, Rhodium, processes 7440-18-8, Ruthenium, processes 7440-21-3, Silicon, processes 7440-22-4, Silver, processes

7440-25-7, Tantalum, processes 7440-48-4, Cobalt, processes 7440-50-8, Copper, processes 7440-57-5, Gold, processes 11135-48-1 37233-01-5  
 37334-35-3 39361-26-7 39408-11-2 60707-36-0 71875-18-8  
 77088-24-5 159744-62-4 185450-48-0 222986-07-4 352009-88-2  
 352009-89-3 352009-90-6 352009-91-7 352009-92-8 352009-93-9  
 352009-94-0 352009-95-1 **352009-96-2** 352009-97-3  
 352009-98-4 352009-99-5 352010-00-5 **352010-01-6**  
 352010-02-7 352010-03-8 352010-04-9 352010-05-0 352010-06-1  
 352010-07-2 352010-08-3 352010-09-4 352010-10-7

RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(high output spin-valve thin-film magnetic **recording** head with reduced asymmetry and no side reading for narrow track widths and method for making same)

IT **352009-96-2 352010-01-6**

RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(high output spin-valve thin-film magnetic **recording** head with reduced asymmetry and no side reading for narrow track widths and method for making same)

L83 ANSWER 16 OF 23 HCAPLUS COPYRIGHT 2002 ACS

2001:245275 Document No. 135:13295 Lattice matching effect of Co-(Cr, Ru) alloy underlayer on magnetic properties of Co-Cr-Pt longitudinal **recording** media. Inaba, Nobuyuki; Futamoto, Masaaki (Tsukuba Research Laboratory, Hitachi Maxell, Ltd., Ibaraki, 300-2496, Japan). IEEE Transactions on Magnetics, 36(5, Pt. 1), 2303-2305 (English) 2000. CODEN: IEMGAQ. ISSN: 0018-9464. Publisher: Institute of Electrical and Electronics Engineers.

AB Magnetic properties were investigated for Co-Cr-Pt thin **films** deposited on **nonmagnetic** hcp.-Co(Cr,Ru) underlayers with different hcp. lattice consts. Higher **coercivity**, higher **coercive** squareness, and lower fluctuation field are obsd. when the hcp. lattice const. is close to that of the Co-Cr-Pt **recording layer**. Temp. dependence of magnetic properties indicates that employment of **nonmagnetic** Co-Cr-Ru **layer** is effective to increase the **coercivity** and to enhance the thermal stability of **recording layer**.

CC 77-1 (Magnetic Phenomena)

Section cross-reference(s): 75

ST cobalt chromium platinum magnetic **recording** media ruthenium lattice matching

IT **Coercive** force (magnetic)

Crystal structure

**Magnetic recording materials**

(lattice matching effect of Co-(Cr,Ru) alloy underlayer on magnetic properties of Co-Cr-Pt longitudinal **recording** media)

IT 177726-89-5, chromium 20, cobalt 68, platinum 12 (atomic)

RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(lattice matching effect of Co-(Cr,Ru) alloy underlayer on magnetic properties of Co-Cr-Pt longitudinal **recording** media)

IT 70146-44-0, chromium 35, cobalt 65 (atomic) **94470-28-7**, cobalt 60, ruthenium 40 (atomic) 174321-15-4, chromium 85, titanium 15 (atomic) **342386-46-3**

RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(underlayer; lattice matching effect of Co-(Cr,Ru) alloy underlayer on magnetic properties of Co-Cr-Pt longitudinal **recording** media)

IT **94470-28-7**, cobalt 60, ruthenium 40 (atomic) **342386-46-3**



RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
(underlayer; lattice matching effect of Co-(Cr,Ru) alloy underlayer on magnetic properties of Co-Cr-Pt longitudinal **recording** media)

L83 ANSWER 17 OF 23 HCAPLUS COPYRIGHT 2002 ACS

2000:876843 Document No. 134:50487 Magnetic **recording** medium, magnetic **storage** apparatus, **recording** method and method of producing magnetic **recording** medium. Abarra, E. Noel; Okamoto, Iwao; Mizoshita, Yoshifumi; Yoshida, Yuki; Umeda, Hisashi; Suzuki, Masaya; Akimoto, Hideyuki; Sato, Hisateru; Kaitsu, Isatake (Fujitsu Limited, Japan). Eur. Pat. Appl. EP 1059629 A2 20001213, 57 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW. APPLICATION: EP 2000-304517 20000526. PRIORITY: JP 1999-161329 19990608; JP 2000-107075 20000407; JP 2000-107071 20000407; JP 2000-107076 20000407; JP 2000-107074 20000407; JP 2000-107072 20000407.

AB A magnetic **recording** medium is provided with at least one exchange layer structure, and a magnetic layer (9) formed on the exchange layer structure. The exchange layer structure includes a ferromagnetic layer (7) and a **nonmagnetic** coupling layer (8) provided on the ferromagnetic layer (7) and under the magnetic layer (9).

IC G11B005-00; G11B005-02; G11B005-64

CC 77-8 (Magnetic Phenomena)

Section cross-reference(s): 55, 56

ST **magnetic recording material**

**multilayer** alloy

IT Electronic device fabrication

Ferromagnetic films

Magnetic films

Magnetic memory devices

Magnetic **multilayers**

**Magnetic recording materials**

(**magnetic recording** medium, **magnetic**

**storage** app., **recording** method and method of

producing magnetic **recording** medium)

IT Ceramics

(magnetic **recording** medium, magnetic **storage** app.,

**recording** method and method of producing magnetic

**recording** medium using)

IT Oxides (inorganic), processes

RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(magnetic **recording** medium, magnetic **storage** app.,

**recording** method and method of producing magnetic

**recording** medium using)

IT Chromium alloy, base

Cobalt alloy, base

Copper alloy, base

Iridium alloy, base

Iron alloy, base

Nickel alloy, base

**Ruthenium alloy, base**

RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(magnetic **recording** medium, magnetic **storage** app.,

**recording** method and method of producing magnetic

**recording** medium)

IT 7439-88-5, Iridium, processes 7440-16-6, Rhodium, processes 7440-18-8,

Ruthenium, processes 11134-15-9 12715-58-1 12735-25-0 59124-09-3

66993-02-0 77325-66-7 92839-06-0 137850-97-6 159744-62-4  
 177899-00-2 197587-27-2, Chromium 37, cobalt 63 (atomic)  
**261352-06-1**, Cobalt 20, ruthenium 80 (atomic) **312602-06-5**  
 , Chromium 20, ruthenium 80 (atomic) **312602-09-8**, Iron 20,  
 ruthenium 80 (atomic) **312602-11-2**, Manganese 20, ruthenium 80  
 (atomic) **312602-14-5**, Nickel 10, ruthenium 90 (atomic)  
 312602-17-8, Chromium 95, molybdenum 2.5, tungsten 2.5 (atomic)  
 312602-21-4, Chromium 80, molybdenum 10, tungsten 10 (atomic)  
 312602-24-7, Boron 4, chromium 22, cobalt 63, platinum 11 (atomic)  
 312602-29-2, Chromium, cobalt base, molybdenum, platinum 312602-32-7,  
 Chromium, cobalt base, niobium, platinum 312602-36-1, Chromium, cobalt  
 base, platinum, tungsten 312602-41-8, Chromium, cobalt base, copper,  
 platinum **312602-45-2**, Cobalt 50-100, ruthenium 0-50 (atomic)  
**312602-49-6**, Chromium 50-100, ruthenium 0-50 (atomic)  
**312602-55-4**, Iron 0-60, ruthenium 40-100 (atomic)  
**312602-61-2**, Nickel 0-10, ruthenium 90-100 (atomic)  
**312602-69-0**, Manganese 0-50, ruthenium 50-100 (atomic)  
 RL: PEP (Physical, engineering or chemical process); TEM (Technical or  
 engineered material use); PROC (Process); USES (Uses)

(magnetic **recording** medium, magnetic **storage** app.,  
**recording** method and method of producing magnetic  
**recording** medium)

IT **261352-06-1**, Cobalt 20, ruthenium 80 (atomic) **312602-06-5**  
 , Chromium 20, ruthenium 80 (atomic) **312602-09-8**, Iron 20,  
 ruthenium 80 (atomic) **312602-11-2**, Manganese 20, ruthenium 80  
 (atomic) **312602-14-5**, Nickel 10, ruthenium 90 (atomic)  
**312602-45-2**, Cobalt 50-100, ruthenium 0-50 (atomic)  
**312602-49-6**, Chromium 50-100, ruthenium 0-50 (atomic) **312602-**  
**55-4**, Iron 0-60, ruthenium 40-100 (atomic) **312602-61-2**,  
 Nickel 0-10, ruthenium 90-100 (atomic) **312602-69-0**, Manganese  
 0-50, ruthenium 50-100 (atomic)

RL: PEP (Physical, engineering or chemical process); TEM (Technical or  
 engineered material use); PROC (Process); USES (Uses)  
 (magnetic **recording** medium, magnetic **storage** app.,  
**recording** method and method of producing magnetic  
**recording** medium)

L83 ANSWER 18 OF 23 HCAPLUS COPYRIGHT 2002 ACS

1999:756134 Document No. 131:345578 Magnetic **recording** medium and  
 Cr-Ru sputtering target.. Ueno, Tomonori (Hitachi Metals, Ltd., Japan).  
 Jpn. Kokai Tokkyo Koho JP 11328648 A2 19991130 Heisei, 4 pp. (Japanese).  
 CODEN: JKXXAF. APPLICATION: JP 1998-129800 19980513.

AB In a magnetic **recording** medium comprising a Co-based magnetic  
 layer formed on a **non-magnetic** substrate via an  
 underlayer, the underlayer comprises Ru 5-18 at% and Cr balance. A  
 sintered sputtering target comprises Ru 5-18 at% and Cr balance. A  
 high-d. medium having a low noise is obtained.

IC ICM G11B005-66  
 ICS C22C027-06; C23C014-34

CC 77-8 (Magnetic Phenomena)  
 Section cross-reference(s): 75

ST magnetic **recording** medium chromium ruthenium alloy sputtering  
 target

IT Magnetic memory devices  
 Sputtering targets

(magnetic **recording** medium and Cr-Ru sputtering target)

IT 122844-03-5, Chromium 90, ruthenium 10 (atomic) **123590-45-4**,  
 Chromium 85, ruthenium 15 (atomic)

RL: DEV (Device component use); USES (Uses)

(magnetic **recording** medium and Cr-Ru sputtering target)

- IT **123590-45-4**, Chromium 85, ruthenium 15 (atomic)  
RL: DEV (Device component use); USES (Uses)  
(magnetic **recording** medium and Cr-Ru sputtering target)
- L83 ANSWER 19 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
1998:811821 Document No. 130:104122 Magnetic **recording** medium for  
high-density **recording**. Futamoto, Masaaki; Inaba, Nobuyuki;  
Yamanaka, Ichisuke; Ito, Akinari; Honda, Yukio (Hitachi, Ltd., Japan).  
Jpn. Kokai Tokkyo Koho JP 10334444 A2 19981218 Heisei, 8 pp. (Japanese).  
CODEN: JKXXAF. APPLICATION: JP 1997-141763 19970530.
- AB The **recording** medium has a **nonmagnetic** substrate,  
.gtoreq.2 undercoat layers, a magnetic layer having hexagonal closest  
packed structure, and a protective film **laminated** in thin order.  
In the **recording** medium, the magnetic layer comprises a  
polycryst. Co base alloy contg. .gtoreq.1 **nonmagnetic** element  
having av. crystal grain size 5-15 nm and the alloy contains .gtoreq.25  
at.% segregation layer of the **nonmagnetic** element in the crystal  
grain boundary. The 1st undercoat layer in contact with the magnetic  
layer is a **nonmagnetic** layer having hexagonal closest packed  
structure or a weak magnetic layer having satd. magnetization .ltoreq.100  
emu/mL and the 2nd undercoat layer formed on the substrate has bcc. or  
NaCl-type structure and predominant orientation in <100> or <211>  
direction.
- IC ICM G11B005-66  
ICS H01F010-12
- CC 77-8 (Magnetic Phenomena)  
Section cross-reference(s): 56
- ST magnetic **recording** medium undercoat layer; cobalt alloy magnetic  
**recording** medium
- IT **Magnetic disks**  
**Magnetic recording materials**  
(high-d. **magnetic recording** medium having .gtoreq.2  
undercoat layers and Co-base alloy magnetic layer)
- IT 57720-36-2, Chromium 45, cobalt 55 (atomic) **94470-28-7**, Cobalt  
60, ruthenium 40 (atomic) 147856-89-1, Chromium 36, cobalt 64 (atomic)  
**219547-78-1** 219547-83-8  
RL: DEV (Device component use); USES (Uses)  
(1st undercoat layer; high-d. magnetic **recording** medium  
having .gtoreq.2 undercoat layers and Co-base alloy magnetic layer)
- IT 1309-48-4, Magnesium oxide (MgO), uses 7440-47-3, Chromium, uses  
7789-24-4, Lithium fluoride (LiF), uses 174321-15-4, Chromium 85,  
titanium 15 (atomic)  
RL: DEV (Device component use); USES (Uses)  
(2nd undercoat layer; high-d. magnetic **recording** medium  
having .gtoreq.2 undercoat layers and Co-base alloy magnetic layer)
- IT 212334-78-6, Chromium 19, cobalt 69, platinum 12 (atomic) 219547-80-5  
219547-82-7 219547-84-9  
RL: DEV (Device component use); USES (Uses)  
(magnetic; high-d. magnetic **recording** medium having .gtoreq.2  
undercoat layers and Co-base alloy magnetic layer)
- IT **94470-28-7**, Cobalt 60, ruthenium 40 (atomic) **219547-78-1**  
RL: DEV (Device component use); USES (Uses)  
(1st undercoat layer; high-d. magnetic **recording** medium  
having .gtoreq.2 undercoat layers and Co-base alloy magnetic layer)
- L83 ANSWER 20 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
1995:837724 Document No. 123:245060 **Multilayer** magnetoresistive  
sensor, its preparation, and a magnetic **storage** system using it.  
Coffey, Kevin R.; Fontana, Robert E.; Howard, James K.; Hylton, Todd L.;  
Parker, Michael A.; Tsang, Ching H. (International Business Machines

Corp., USA). Can. Pat. Appl. CA 2134711 AA 19950624, 35 pp. (English).  
CODEN: CPXXEB. APPLICATION: CA 1994-2134711 19941031. PRIORITY: US  
1993-173590 19931223.

- AB A magnetoresistive read sensor incorporates a **multilayer** sensing element formed of .gtoreq.1 magnetoresistive elements in a planar array, each magnetoresistive element having a **multilayer** structure of .gtoreq.2 ferromagnetic layers sepd. by a **nonmagnetic** layer. The ferromagnetic layers are coupled antiferromagnetically by magnetostatic coupling at opposing edges of the ferromagnetic layers. A bias layer sepd. from the magnetoresistive sensing element by a spacer layer provides a magnetic field to bias the magnetoresistive sensing element at a desired nonsignal point for linear response. The magnetoresistive sensing element is formed by alternately depositing layers of ferromagnetic material and layers of **nonmagnetic** material on a substrate and then patterning the resulting structure using photolithog. techniques to provide a planar array of magnetoresistive elements. A conductive layer is deposited over the array, filling in the spaces sepg. the magnetoresistive elements, to provide elec. cond. between the elements in the plane of the structure.
- IC ICM G11B005-39  
ICS G11B005-706; G01N027-72
- CC 77-8 (Magnetic Phenomena)  
Section cross-reference(s): 76
- ST **multilayer** magnetoresistive sensor prepn; magnetic  
**storage** system **multilayer** magnetoresistive sensor;  
**recording** head **multilayer** magnetoresistive
- IT Sensors  
(magnetoresistive, **multilayer**; for magnetic **storage**  
systems)
- IT Electric conductors  
(**multilayer** magnetoresistive sensors contg.)
- IT Magnetoresistors  
(sensors from, **multilayer**; for magnetic **storage**  
systems)
- IT **Magnetic substances**  
(ferro-, **multilayer** magnetoresistive sensors  
contg.)
- IT Lithography  
(photo-, in manuf. of **multilayer** magnetoresistive sensors)
- IT Cobalt alloy, base  
Copper alloy, base  
Gold alloy, base  
Iron alloy, base  
Nickel alloy, base  
**Ruthenium alloy**, base  
Silver alloy, base  
RL: DEV (Device component use); PEP (Physical, engineering or chemical  
process); PROC (Process); USES (Uses)  
(manuf. of **multilayer** magnetoresistive sensors contg.)
- IT 1344-28-1, Alumina, processes 7429-90-5, Aluminum, processes  
7439-89-6, Iron, processes 7440-02-0, Nickel, processes 7440-18-8,  
Ruthenium, processes 7440-22-4, Silver, processes 7440-25-7, Tantalum,  
processes 7440-32-6, Titanium, processes 7440-47-3, Chromium,  
processes 7440-48-4, Cobalt, processes 7440-50-8, Copper, processes  
7440-57-5, Gold, processes 7440-58-6, Hafnium, processes 7440-65-5,  
Yttrium, processes 7440-67-7, Zirconium, processes 7631-86-9, Silica,  
processes 11148-32-6 12649-48-8 91867-19-5 168754-63-0  
RL: DEV (Device component use); PEP (Physical, engineering or chemical  
process); PROC (Process); USES (Uses)  
(manuf. of **multilayer** magnetoresistive sensors contg.)

L83 ANSWER 21 OF 23 HCAPLUS COPYRIGHT 2002 ACS

1994:708809 Document No. 121:308809 Ab initio calculations of the deviations from Matthiessen's rule for dilute ternary alloys. Mertig, I.; Zeller, R.; Dederichs, P. H. (Inst. Theoretische Phys., Tech. Univ. Dresden, Dresden, D-01062, Germany). Physical Review B: Condensed Matter and Materials Physics, 49(17), 11767-72 (English) 1994. CODEN: PRBMDO. ISSN: 0163-1829.

AB The authors report ab initio calcns. of the residual resistivity and the deviations from Matthiessen's rule for dil. ternary alloys. The authors consider **nonmagnetic** (Cu) as well as ferromagnetic host materials (Ni) with an admixt. of simple-metal (4sp, 5sp) or transition-metal (3d, 4d) impurities. The calcns. are performed within the frame of d. functional theory and the Korringa-Kohn-Rostoker Green's-function method. The transport is described quasiclassically by means of the Boltzmann equation. In the case of a ferromagnetic host a two-current model is applied. Both impurity atoms are considered as noninteracting and the scattering properties of each impurity atom are calcd. self-consistently including in addn. to the impurity potential one shell of perturbed host potentials around the impurity. The results show satisfactory agreement with expts. and confirm the validity of Matthiessen's rule in **nonmagnetic** systems. In ferromagnetic systems the two-current model is confirmed.

CC 65-6 (General Physical Chemistry)  
Section cross-reference(s): 76, 77

ST Matthiessen rule **nonmagnetic** ferromagnetic ternary alloy;  
residual resistivity ternary alloy density functional; KKR Green function ternary alloy resistivity

IT **Magnetic substances**

(ferro-, dil. ternary alloys, deviations from Matthiessen's rule in, d. functional and KKR Green's-function calcn. of)

IT 11110-85-3, Nickel 50, titanium 50 (atomic) 11134-28-4 12649-89-7  
157089-36-6 157089-37-7 157089-38-8 157089-39-9  
157089-40-2 157089-41-3 157089-42-4 157089-43-5  
159375-50-5 159375-51-6 159375-52-7 159375-53-8 159375-54-9  
159375-55-0 159375-56-1 159375-57-2 159375-58-3 159375-59-4  
159375-60-7 159375-61-8 159375-62-9 159375-63-0 159375-64-1

RL: PRP (Properties)

(residual resistivity and deviations from Matthiessen's rule for, d. functional and KKR Green's-function calcn. of)

IT 157089-36-6 157089-38-8 157089-40-2

RL: PRP (Properties)

(residual resistivity and deviations from Matthiessen's rule for, d. functional and KKR Green's-function calcn. of)

L83 ANSWER 22 OF 23 HCAPLUS COPYRIGHT 2002 ACS

1987:603185 Document No. 107:203185 Ferromagnetic materials. Ootomo, Moichi; Nakatani, Ryoichi; Kumasaka, Takayuki; Yamashita, Takeo; Saito, Noritoshi; Kobayashi, Toshio (Hitachi, Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 62139846 A2 19870623 Showa, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1985-278924 19851213.

AB An Fe alloy contains >0.1 at.% Ru, Rh, Pd, Ir, and/or Pt. The platinum metals in the alloy are controlled in accordance with 2 .ltoreq. (3.4 Ru + 2.8 Rh + 4.7 Pd + 6 Ir + 6.5 Pt) .ltoreq.6. A monolayer film of the Fe alloy or, optionally, a **multilayer** film consisting of an interlayer (magnetic or **nonmagnetic**) 20-500 .ANG. thick sandwiched between 2 layers of the Fe alloy, each 0.02-0.5 .mu. thick, shows high magnetic satn., low magnetostriction, and high corrosion resistance. The films are suitable for magnetic heads for **video tape recorders**. Thus, a Fe99Ru1 film .apprx.1.mu. thick

was manufd. by sputter coating the alloy on a glass substrate. The film showed a magnetic satn. 20.8 kG, a coercive force 2.0 Oe, a magnetostriction coeff.  $-0.1 \times 10^{-6}$ , and a relative decrease in magnetic satn. after a salt-water-spray test 9% vs. 18 kG, 2.3 Oe,  $0.2 \times 10^{-6}$ , and 57%, resp., for similarly manufd. Fe<sub>88</sub>Si<sub>12</sub> films.

IC ICM C22C038-00  
ICS C23C014-14; G11B005-127; H01F001-14  
CC 55-3 (Ferrous Metals and Alloys)  
Section cross-reference(s): 77  
ST **ruthenium iron alloy** magnetic film; magnetic head  
**ruthenium iron alloy**  
IT **Recording materials**  
(**magnetic**, iron-platinum metal alloys for)  
IT 12614-48-1 91018-24-5 111148-20-0 111148-21-1 111148-22-2  
111148-23-3 111148-24-4 111148-25-5 111148-26-6  
RL: USES (Uses)  
(magnetic satn. and magnetostriction of, for magnetic heads of  
**video tape recorders**)

L83 ANSWER 23 OF 23 HCAPLUS COPYRIGHT 2002 ACS

1985:55332 Document No. 102:55332 Magnetic **recording** medium.  
(Nippon Telegraph and Telephone Public Corp., Japan). Jpn. Kokai Tokkyo  
Koho JP 59154635 A2 19840903 Showa, 4 pp. (Japanese). CODEN: JKXXAF.  
APPLICATION: JP 1983-27802 19830223.

AB A magnetic **recording** structure consists of a Co alloy thin film  
on a substrate. The Co alloy contains Cr, Ru, Fe, and/or Os and is a hcp.  
ferromagnetic film with its c-axis perpendicular to the substrate. The Co  
alloy is formed on a substrate via a **nonmagnetic** underlayer.  
Optionally, the underlay may consist of a similar Co alloy.

IC G11B005-70; H01F010-30  
CC 79-3 (Inorganic Analytical Chemistry)  
ST chromium alloy perpendicular magnetic **recording**  
IT Glass, oxide  
RL: ANST (Analytical study)  
(**magnetic disk** support from)  
IT Sputtering  
(of cobalt alloys from magnetic **recording** devices)  
IT **Recording materials**  
(**magnetic**, cobalt alloys, for **disks** and  
**tapes**)  
IT **Recording apparatus**  
(**magnetic**, **disks**, sputtering in fabrication of)  
IT **Recording apparatus**  
(**magnetic**, **tapes**, sputtering in fabrication of)  
IT Cobalt alloy, base  
RL: ANST (Analytical study)  
(magnetic **recording** structures from sputtering of)  
IT 11114-92-4 12646-82-1 12735-25-0 52973-73-6 57139-85-2  
94470-25-4 94470-26-5 **94470-27-6 94470-28-7**  
94470-29-8 94470-30-1 **94470-31-2** 94470-32-3  
**94470-33-4**  
RL: ANST (Analytical study)  
(magnetic **recording** structures from sputtering of)  
IT **94470-27-6 94470-28-7 94470-31-2**  
**94470-33-4**  
RL: ANST (Analytical study)  
(magnetic **recording** structures from sputtering of)

=> d L83 1-26 ti

- L83 ANSWER 1 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
TI Magnetic **recording** medium with a NiAlRu seed layer
- L83 ANSWER 2 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
TI Low-noise **magnetic recording materials**,  
their manufacture, and magnetic **recording** apparatus
- L83 ANSWER 3 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
TI Manufacture of magnetic **recording** media
- L83 ANSWER 4 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
TI Magnetic **recording** medium, its manufacture, and magnetic  
input/output apparatus using the medium
- L83 ANSWER 5 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
TI Magnetic **recording** medium, its manufacture, and magnetic  
**recording**/reproducing apparatus for it
- L83 ANSWER 6 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
TI Longitudinal magnetic **recording** medium and magnetic  
**recording** apparatus with high **recording** density,  
suppressed noise and improved stability
- L83 ANSWER 7 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
TI Magnetic **recording** medium for high density **recording**
- L83 ANSWER 8 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
TI Magnetic **recording** medium and magnetic memory device
- L83 ANSWER 9 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
TI Magnetic **recording** medium
- L83 ANSWER 10 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
TI Magnetic **recording** medium
- L83 ANSWER 11 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
TI Perpendicular magnetic **recording** medium and apparatus for  
reproducing of **recorded** information
- L83 ANSWER 12 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
TI Perpendicular magnetic **recording** medium involving ruthenium  
alloy underlayer and magnetic **recording** apparatus
- L83 ANSWER 13 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
TI Durable magnetic **recording** media possessing chromium alloy-based  
**nonmagnetic** underlayers and their manufacture
- L83 ANSWER 14 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
TI Improvement of initial growth **layer** in CoCr-alloy thin  
**film** media
- L83 ANSWER 15 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
TI High output spin-valve thin-film magnetic **recording** head with  
reduced asymmetry and no side reading for narrow track widths and method  
for making the same
- L83 ANSWER 16 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
TI Lattice matching effect of Co-(Cr, Ru) alloy underlayer on magnetic  
properties of Co-Cr-Pt longitudinal **recording** media

L83 ANSWER 17 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
TI Magnetic **recording** medium, magnetic **storage** apparatus,  
**recording** method and method of producing magnetic  
**recording** medium

L83 ANSWER 18 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
TI Magnetic **recording** medium and Cr-Ru sputtering target.

L83 ANSWER 19 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
TI Magnetic **recording** medium for high-density **recording**

L83 ANSWER 20 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
TI **Multilayer** magnetoresistive sensor, its preparation, and a  
magnetic **storage** system using it

L83 ANSWER 21 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
TI Ab initio calculations of the deviations from Matthiessen's rule for  
dilute ternary alloys

L83 ANSWER 22 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
TI Ferromagnetic materials

L83 ANSWER 23 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
TI Magnetic **recording** medium

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L83 ANSWER 1 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
2002:609899 Document No. 137:162694 Magnetic **recording** medium with  
a NiAlRu seed layer. Wu, Stella Z.; Chen, Qixu; Harkness, Samuel D., IV;  
Ranjan, Rajiv Y. (Seagate Technology LLC, USA). U.S. US 6432562 B1  
20020813, 7 pp. (English). CODEN: USXXAM. APPLICATION: US 1999-393328  
19990910. PRIORITY: US 1998-PV101902 19980925.

AB High areal d. magnetic **recording** media exhibiting high magnetic  
performance, e.g., narrow PW50, and high OW, and high SNR, are formed with  
a NiAlRu seed layer. Embodiments of the present invention include sputter  
depositing a NiAlRu seedlayer on a **nonmagnetic** substrate and  
sequentially depositing thereon a Cr or Cr alloy underlayer, e.g., CrMo,  
CrMn, CrV or CrW, a magnetic layer, e.g., a Co-Cr-contg. magnetic alloy  
layer, and a protective overcoat, e.g., a C-contg. protective overcoat.

IC ICM G11B005-66  
ICS G11B005-70; B05D005-12; C23C014-34

NCL 428694000TS

CC 77-8 (Magnetic Phenomena)  
Section cross-reference(s): 56

ST seed layer aluminum nickel ruthenium sputtering **magnetic**  
**disk**

IT **Magnetic disks**  
Magnetic films  
**Magnetic recording materials**  
Sputtering  
(**magnetic recording** medium with sputtered  
aluminum-nickel-ruthenium seed layer)

IT Chromium alloy, base  
RL: PEP (Physical, engineering or chemical process); PYP (Physical  
process); TEM (Technical or engineered material use); PROC (Process); USES  
(Uses)  
(magnetic **recording** medium with sputtered



- aluminum-nickel-ruthenium seed layer)
- IT 7440-47-3, Chromium, processes 223426-73-1, Aluminum 50, nickel 45, ruthenium 5 (atomic)  
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
(magnetic **recording** medium with sputtered aluminum-nickel-ruthenium seed layer)
- IT 11114-92-4 39314-47-1 81705-66-0 91033-96-4 142295-96-3  
155837-44-8, Chromium 50-100, molybdenum 0-50 (atomic) 215952-38-8  
445306-86-5, Chromium 50-100, manganese 0-50 (atomic) 445306-87-6, Chromium 50-100, tungsten 0-50 (atomic) **445306-88-7**, Aluminum 45-55, nickel 40-50, ruthenium 0.1-10 (atomic) 445306-89-8, Aluminum 50, nickel 44-46, ruthenium 4-6 (atomic) 445306-90-1, Aluminum 45-55, nickel 40-50, ruthenium 4-6 (atomic)  
RL: TEM (Technical or engineered material use); USES (Uses)  
(magnetic **recording** medium with sputtered aluminum-nickel-ruthenium seed layer)
- IT **445306-88-7**, Aluminum 45-55, nickel 40-50, ruthenium 0.1-10 (atomic)  
RL: TEM (Technical or engineered material use); USES (Uses)  
(magnetic **recording** medium with sputtered aluminum-nickel-ruthenium seed layer)
- L83 ANSWER 2 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
2002:553441 Document No. 137:118427 Low-noise **magnetic recording materials**, their manufacture, and magnetic **recording** apparatus. Uesumi, Hiroyuki; Oikawa, Tadaaki; Shimizu, Takahiro; Takizawa, Naoki (Fuji Electric Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2002208126 A2 20020726, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-748 20010105.
- AB The **recording** material comprises (a) a **nonmagnetic** plastic support, (b) a **nonmagnetic** primer layer, (c) a 1st **nonmagnetic** metal interlayer, (d) a 2nd **nonmagnetic** metal interlayer, (e) a magnetic layer contg. Co- and Pt-contg. ferromagnetic grains and oxide grain boundaries, (f) a protective layer, and (g) a liq. lubricant layer, formed in the order. In the material, the 1st **nonmagnetic** interlayer contains Ru, Re, and/or Os and O and the 2nd **nonmagnetic** interlayer is Co-Cr alloys contg. Nb, Mo, Ru, Rh, Pd, Ta, W, Re, Os, Ir, and/or Pt, or vice versa. Manuf. of the materials and **recording** app. including the materials are also claimed.
- IC ICM G11B005-65  
ICS G11B005-73; G11B005-738; G11B005-84; H01F010-28; H01F010-30  
CC 77-8 (Magnetic Phenomena)
- ST **nonmagnetic** metal interlayer **magnetic disk**;  
magnetic **recording** app low noise **disk**
- IT Polycarbonates, uses  
Polyolefins  
RL: DEV (Device component use); USES (Uses)  
(**disk** supports; low-noise **magnetic recording materials** with bilayered **nonmagnetic** metal layers)
- IT **Magnetic disks**  
(low-noise **magnetic recording materials** with bilayered **nonmagnetic** metal layers)
- IT 7631-86-9, Silica, uses  
RL: DEV (Device component use); USES (Uses)  
(magnetic layer contg.; low-noise **magnetic recording materials** with bilayered **nonmagnetic** metal layers)

- IT 129516-26-3, Chromium 10, cobalt 78, platinum 12 (atomic)  
RL: DEV (Device component use); USES (Uses)  
(magnetic layer; low-noise **magnetic recording materials** with bilayered **nonmagnetic** metal layers)
- IT 7439-88-5, Iridium, uses 7439-98-7, Molybdenum, uses 7440-03-1, Niobium, uses 7440-04-2, Osmium, uses 7440-05-3, Palladium, uses 7440-15-5, Rhenium, uses 7440-16-6, Rhodium, uses 7440-25-7, Tantalum, uses  
RL: DEV (Device component use); USES (Uses)  
(**nonmagnetic** chromium-cobalt interlayer contg.; low-noise **magnetic recording materials** with bilayered **nonmagnetic** metal layers)
- IT 7440-18-8, Ruthenium, uses 7782-44-7, Oxygen, uses  
RL: DEV (Device component use); USES (Uses)  
(**nonmagnetic** interlayer contg.; low-noise **magnetic recording materials** with bilayered **nonmagnetic** metal layers)
- IT 341036-31-5, Chromium 25, cobalt 50, ruthenium 25 (atomic)  
443684-12-6, Chromium 35, cobalt 50, ruthenium 15 (atomic)  
443684-13-7, Chromium 40, cobalt 50, tungsten 10 (atomic) 443684-14-8, Chromium 44, cobalt 50, platinum 6 (atomic) 443684-15-9, Chromium 38, cobalt 50, platinum 12 (atomic)  
RL: DEV (Device component use); USES (Uses)  
(**nonmagnetic** interlayer; low-noise **magnetic recording materials** with bilayered **nonmagnetic** metal layers)
- IT 7440-47-3, Chromium, uses 37373-03-8, Chromium 80, molybdenum 20 (atomic)  
RL: DEV (Device component use); USES (Uses)  
(**nonmagnetic** primer layer; low-noise **magnetic recording materials** with bilayered **nonmagnetic** metal layers)
- IT 341036-31-5, Chromium 25, cobalt 50, ruthenium 25 (atomic)  
443684-12-6, Chromium 35, cobalt 50, ruthenium 15 (atomic)  
RL: DEV (Device component use); USES (Uses)  
(**nonmagnetic** interlayer; low-noise **magnetic recording materials** with bilayered **nonmagnetic** metal layers)
- L83 ANSWER 3 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
2002:539347 Document No. 137:102832 Manufacture of magnetic **recording** media. Shimizu, Kenji; Sakai, Hiroshi (Showa Denko K. K., Japan). Jpn. Kokai Tokkyo Koho JP 2002203306 A2 20020719, 13 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-401139 20001228.
- AB Magnetic **recording** media contain, on **nonmagnetic** substrates, **laminates** of at least soft magnetic base films, orientation adjustment films which adjust the orientation of films right above them, vertical magnetic films whose magnetization axis is vertically oriented regarding the substrates, and protective films. The orientation adjustment films comprise 1st layers having B2 structure and thickness of 0.1-20 nm, and 2nd layers having hcp structure and thickness of 0.1-50 nm. The magnetic **recording** media have excellent noise characteristic and experience little thermal fluctuation.
- IC ICM G11B005-667  
ICS G11B005-65; G11B005-738; G11B005-851; H01F010-08; H01F010-26; H01F041-14
- CC 77-8 (Magnetic Phenomena)
- ST magnetic **recording** media orientation adjustment film
- IT **Magnetic recording materials**  
Magnetization

(manuf. of **magnetic recording** media contg.  
orientation adjustment films)

IT Magnetic films  
(manuf. of magnetic **recording** media contg. orientation  
adjustment films and soft and hard magnetic films)

IT 7440-05-3, Palladium, uses 7440-18-8, Ruthenium, uses 7440-32-6,  
Titanium, uses 7440-48-4, Cobalt, uses 7440-67-7, Zirconium, uses  
11134-20-6, Cobalt 84, samarium 16 (atomic) 11148-13-3, Iron 20, nickel  
80 (atomic) 12707-14-1, Aluminum 50, iron 50 (atomic) 12780-63-1,  
Aluminum 50, nickel 50 (atomic) 57720-36-2, Chromium 45, cobalt 55  
(atomic) 88873-10-3, Iron 85, zirconium 15 (atomic) 94470-26-5,  
Chromium 40, cobalt 60 (atomic) 94858-24-9 104193-19-3, Cobalt 89,  
niobium 7, zirconium 4 (atomic) 104675-01-6, Aluminum 55, nickel 45  
(atomic) **136548-17-9**, Aluminum 50, ruthenium 50 (atomic)  
341037-16-9, Chromium 22, cobalt 64, platinum 12, tantalum 2 (atomic)  
**365403-57-2**, Chromium 30, ruthenium 70 (atomic) 381243-05-6,  
Boron 4, chromium 20, cobalt 62, platinum 14 (atomic) **434335-34-9**  
, Ruthenium 80, titanium 20 (atomic) 441332-67-8, Aluminum 45, boron 10,  
nickel 45 (atomic) 441332-68-9, Chromium 17, cobalt 61, platinum 22  
(atomic) 442550-25-6, Cobalt 90, tantalum 4, zirconium 6 (atomic)  
442550-26-7, Iron 75, nitrogen 10, tantalum 15 (atomic) 442550-27-8,  
Chromium 35, cobalt 55, manganese 10 (atomic) 442550-28-9, Boron 5,  
chromium 30, cobalt 60, tantalum 5 (atomic)  
RL: DEV (Device component use); USES (Uses)  
(manuf. of magnetic **recording** media contg. orientation  
adjustment films, vertical magnetic films, soft magnetic films, and  
**nonmagnetic** intermediate films contg.)

IT **136548-17-9**, Aluminum 50, ruthenium 50 (atomic)  
**365403-57-2**, Chromium 30, ruthenium 70 (atomic)  
**434335-34-9**, Ruthenium 80, titanium 20 (atomic)  
RL: DEV (Device component use); USES (Uses)  
(manuf. of magnetic **recording** media contg. orientation  
adjustment films, vertical magnetic films, soft magnetic films, and  
**nonmagnetic** intermediate films contg.)

L83 ANSWER 4 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
2002:521191 Document No. 137:102829 Magnetic **recording** medium, its  
manufacture, and magnetic input/output apparatus using the medium.  
Shimizu, Kenji; Sakai, Hiroshi; Yang, Hui; Sakawaki, Akira (Showa Denko K.  
K., Japan). Jpn. Kokai Tokkyo Koho JP 2002197635 A2 20020712, 16 pp.  
(Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-400272 20001228.

AB In the **recording** medium comprising a **nonmagnetic**  
substrate successively **laminated** with a soft magnetic substrate  
film, an orientation-control film, a perpendicular magnetic film, and a  
soft magnetic film, the orientation-control and perpendicular magnetic  
films contain .gtoreq.1 layers with hcp or fcc structure, and the  
uppermost soft magnetic layer is exchange-coupled with the neighboring  
perpendicular magnetic layer. The method involves **lamination** of  
a soft magnetic film on a perpendicular magnetic film. The app. has the  
above **recording** medium and a magnetic head. Fluctuation of  
magnetization at the surface of the perpendicular magnetic film is  
effectively suppressed because of exchange coupling between the magnetic  
film and the neighboring soft magnetic film.

IC ICM G11B005-66  
ICS G11B005-65; G11B005-667; G11B005-72; G11B005-738; G11B005-851  
CC 77-8 (Magnetic Phenomena)

ST **magnetic recording disk** exchange coupling;  
fluctuation magnetic domain prevention **recording disk**;  
hcp fcc perpendicular **magnetic recording disk**

IT **Magnetic disks**

## Magnetic memory devices

- (manuf. of **magnetic recording disk** for high-d. magnetic input/output app.)
- IT 86441-20-5 381243-05-6, Boron 4, chromium 20, cobalt 62, platinum 14 (atomic)  
RL: DEV (Device component use); USES (Uses)  
(manuf. of **magnetic recording disk** for high-d. magnetic input/output app.)
- IT 7440-18-8, Ruthenium, uses 7440-44-0, Carbon, uses 7440-50-8, Copper, uses 12780-63-1, Aluminum 50, nickel 50 (atomic) 115457-43-7, Cobalt 40, zirconium 60 (atomic) **122844-04-6**, Chromium 70, ruthenium 30 (atomic)  
RL: DEV (Device component use); USES (Uses)  
(orientation-control film; manuf. of **magnetic recording disk** for high-d. magnetic input/output app.)
- IT 104193-19-3, Cobalt 89, niobium 7, zirconium 4 (atomic)  
RL: DEV (Device component use); USES (Uses)  
(soft magnetic film; manuf. of **magnetic recording disk** for high-d. magnetic input/output app.)
- IT **122844-04-6**, Chromium 70, ruthenium 30 (atomic)  
RL: DEV (Device component use); USES (Uses)  
(orientation-control film; manuf. of **magnetic recording disk** for high-d. magnetic input/output app.)

L83 ANSWER 5 OF 23 HCAPLUS COPYRIGHT 2002 ACS

2002:518104 Document No. 137:102827 Magnetic **recording** medium, its manufacture, and magnetic **recording**/reproducing apparatus for it. Shimizu, Kenji; Sakai, Hiroshi (Showa Denko K. K., Japan). Jpn. Kokai Tokkyo Koho JP 2002197643 A2 20020712, 14 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-396074 20001226.

- AB The **recording** medium comprises a **nonmagnetic** substrate on which a soft magnetic undercoat layer, an orientation-controlling film, a magnetic layer with axis of easy magnetization oriented perpendicular to the substrate, and a protective film are formed. In the undercoat layer, part or all of the surface facing to the orientation-controlling film is oxidized, and the oxidized layer has thickness  $\geq 0.1$  and  $< 3$  nm. The method for manufg. the **recording** medium involves a process for oxidization of the undercoat layer. The app. using the **recording** medium is also claimed. High-d. **recording** can be achieved by using the **recording** medium.
- IC ICM G11B005-738  
ICS G11B005-65; G11B005-667; G11B005-851
- CC 77-8 (Magnetic Phenomena)
- ST high density magnetic **recording** medium oxidization undercoat layer
- IT Magnetic memory devices  
**Magnetic recording materials**  
Oxidation  
(**magnetic recording** medium with surface-oxidized soft magnetic undercoat layer for high-d. **recording** /reproducing)
- IT Gadolinium alloy, base  
Hafnium alloy, base  
Rhenium alloy, base  
Terbium alloy, base  
Yttrium alloy, base  
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material

use); PROC (Process); USES (Uses)  
 (orientation-controlling layer; magnetic **recording** medium  
 with surface-oxidized soft magnetic undercoat layer for high-d.  
**recording**/reproducing)

IT 7440-05-3, Palladium, processes  
 RL: DEV (Device component use); PEP (Physical, engineering or chemical  
 process); PYP (Physical process); TEM (Technical or engineered material  
 use); PROC (Process); USES (Uses)  
 (lamine with Co, perpendicular magnetic layer; magnetic  
**recording** medium with surface-oxidized soft magnetic undercoat  
 layer for high-d. **recording**/reproducing)

IT 7440-48-4, Cobalt, processes  
 RL: DEV (Device component use); PEP (Physical, engineering or chemical  
 process); PYP (Physical process); TEM (Technical or engineered material  
 use); PROC (Process); USES (Uses)  
 (lamine with Pd, perpendicular magnetic layer; magnetic  
**recording** medium with surface-oxidized soft magnetic undercoat  
 layer for high-d. **recording**/reproducing)

IT 7440-18-8, Ruthenium, processes 7440-32-6, Titanium, processes  
 7440-66-6, Zinc, processes 7440-67-7, Zirconium, processes 11114-55-9  
 12683-48-6 12707-14-1, Aluminum 50, iron 50 (atomic) 12780-63-1,  
 Aluminum 50, nickel 50 (atomic) 12781-95-2 51880-05-8 55891-00-4  
 104675-01-6, Aluminum 55, nickel 45 (atomic) **136548-17-9**,  
 Aluminum 50, ruthenium 50 (atomic) **434335-58-7**, Carbon 10,  
 ruthenium 90 (atomic) **441332-66-7**, Boron 10, chromium 20,  
 ruthenium 70 (atomic) 441332-67-8, Aluminum 45, boron 10, nickel 45  
 (atomic)  
 RL: DEV (Device component use); PEP (Physical, engineering or chemical  
 process); PYP (Physical process); TEM (Technical or engineered material  
 use); PROC (Process); USES (Uses)  
 (orientation-controlling layer; magnetic **recording** medium  
 with surface-oxidized soft magnetic undercoat layer for high-d.  
**recording**/reproducing)

IT 94858-24-9 381243-05-6, Boron 4, chromium 20, cobalt 62, platinum 14  
 (atomic) 441332-68-9, Chromium 17, cobalt 61, platinum 22 (atomic)  
 RL: DEV (Device component use); PEP (Physical, engineering or chemical  
 process); PYP (Physical process); TEM (Technical or engineered material  
 use); PROC (Process); USES (Uses)  
 (perpendicular magnetic layer; magnetic **recording** medium with  
 surface-oxidized soft magnetic undercoat layer for high-d.  
**recording**/reproducing)

IT 60569-79-1, Boron 20, iron 80 (atomic) 104193-19-3, Cobalt 89, niobium  
 7, zirconium 4 (atomic) 165253-39-4, Carbon 10, iron 80, tantalum 10  
 (atomic) 441332-61-2, Cobalt 89, niobium 5, zirconium 6 (atomic)  
 441332-62-3, Cobalt 89, niobium 3, yttrium 8 (atomic) 441332-63-4,  
 Hafnium 10, iron 75, oxygen 15 (atomic) 441332-64-5, Iron 70, nitrogen  
 15, tantalum 15 (atomic) 441332-65-6, Iron 70, oxygen 15, zirconium 15  
 (atomic)  
 RL: CPS (Chemical process); DEV (Device component use); PEP (Physical,  
 engineering or chemical process); PYP (Physical process); TEM (Technical  
 or engineered material use); PROC (Process); USES (Uses)  
 (undercoat layer; magnetic **recording** medium with  
 surface-oxidized soft magnetic undercoat layer for high-d.  
**recording**/reproducing)

IT **136548-17-9**, Aluminum 50, ruthenium 50 (atomic)  
**434335-58-7**, Carbon 10, ruthenium 90 (atomic) **441332-66-7**  
 , Boron 10, chromium 20, ruthenium 70 (atomic)  
 RL: DEV (Device component use); PEP (Physical, engineering or chemical  
 process); PYP (Physical process); TEM (Technical or engineered material  
 use); PROC (Process); USES (Uses)

(orientation-controlling layer; magnetic **recording** medium with surface-oxidized soft magnetic undercoat layer for high-d. **recording**/reproducing)

L83 ANSWER 6 OF 23 HCAPLUS COPYRIGHT 2002 ACS

2002:409151 Document No. 136:410476 Longitudinal magnetic **recording** medium and magnetic **recording** apparatus with high

**recording** density, suppressed noise and improved stability.

Kanbe, Tetsuya; Yahisa, Yotsuo; Matsuda, Yoshihumi; Inagaki, Jo; Sakamoto, Koji (Japan). U.S. Pat. Appl. Publ. US 2002064691 A1 20020530, 19 pp.

(English). CODEN: USXXCO. APPLICATION: US 2001-888523 20010626.

PRIORITY: JP 2000-313120 20001006; JP 2000-381692 20001211.

AB The title longitudinal magnetic **recording** medium includes a **nonmagnetic** substrate, a 1st underlayer having at least one of an amorphous structure and a fine crystal structure formed on the **nonmagnetic** substrate, a 2nd underlayer having a bcc. structure formed on the 1st underlayer, a 3rd underlayer having a hexagonal closed packed structure formed on the 2nd underlayer, and a magnetic layer having the hexagonal closed packed structure formed on the 3rd underlayer, wherein the 3rd underlayer is composed of an alloy contg. Co and Ru.

IC ICM G11B005-66

NCL 428694000TS

CC 77-8 (Magnetic Phenomena)

Section cross-reference(s): 56

ST cobalt ruthenium alloy magnetic **recording**

IT Crystal structure types

(bcc.; longitudinal magnetic **recording** medium and magnetic **recording** app. with high **recording** d., suppressed noise and improved stability)

IT Crystal structure types

(hexagonal, closed packed; longitudinal magnetic **recording** medium and magnetic **recording** app. with high **recording** d., suppressed noise and improved stability)

IT Magnetic films

(longitudinal magnetic **recording** medium and magnetic **recording** app. with high **recording** d., suppressed noise and improved stability)

IT **94470-28-7**, Cobalt 60, ruthenium 40 (atomic) 353474-74-5, Boron 8, chromium 20, cobalt 58, platinum 14 (atomic) 381243-05-6, Boron 4, chromium 20, cobalt 62, platinum 14 (atomic) 412942-18-8, Chromium 40, nickel 52, zirconium 8 (atomic) 412942-33-7, Boron 6, chromium 20, cobalt 60, platinum 14 (atomic) 412942-34-8, Boron 8, chromium 18, cobalt 58, platinum 16 (atomic) 412942-36-0, Boron 6, chromium 18, cobalt 62, platinum 14 (atomic) 412942-38-2, Boron 8, chromium 20, cobalt 56, platinum 16 (atomic)

RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses).

(longitudinal magnetic **recording** medium and magnetic **recording** app. with high **recording** d., suppressed noise and improved stability)

IT 52360-02-8, Nickel 62, tantalum 38 (atomic) **77592-17-7**, Cobalt 50, ruthenium 50 (atomic) **120171-63-3**, Cobalt 30, ruthenium 70 (atomic) **153084-87-8**, Cobalt 70, ruthenium 30 (atomic)

**273379-93-4**, Cobalt 65, ruthenium 35 (atomic) 412942-08-6, Chromium 32, cobalt 62, zirconium 6 (atomic) 412942-10-0, Chromium 36, cobalt 56, tantalum 8 (atomic) 412942-11-1, Chromium 34, cobalt 41, tungsten 25 (atomic) 412942-12-2, Cobalt 54, titanium 6, vanadium 40 (atomic) 412942-13-3, Boron 8, cobalt 52, vanadium 40 (atomic) 412942-14-4, Cobalt 38, silicon 12, vanadium 50 (atomic) 412942-15-5,

Cobalt 35, manganese 45, niobium 20 (atomic) 412942-16-6, Cobalt 30, manganese 45, molybdenum 25 (atomic) 412942-17-7, Nickel 45, tungsten 55 (atomic) 412942-19-9, Chromium 40, nickel 48, titanium 12 (atomic) 412942-20-2, Boron 15, nickel 35, vanadium 50 (atomic) 412942-21-3, Nickel 30, silicon 15, vanadium 55 (atomic) 412942-22-4, Molybdenum 30, nickel 32, vanadium 38 (atomic) **412942-25-7**, Cobalt 40, ruthenium 60 (atomic) **412942-26-8**, Boron 1, cobalt 59, ruthenium 40 (atomic) **412942-27-9**, Boron 3, cobalt 57, ruthenium 40 (atomic) **412942-28-0**, Boron 6, cobalt 54, ruthenium 40 (atomic) **412942-29-1**, Boron 12, cobalt 48, ruthenium 40 (atomic) **412942-30-4**, Boron 15, cobalt 45, ruthenium 40 (atomic) 431898-42-9, Cobalt 70, molybdenum 10, titanium 20 (atomic) 431898-43-0, Cobalt 70, titanium 20, tungsten 10 (atomic) 431898-44-1, Cobalt 75, molybdenum 5, titanium 20 (atomic) 431898-45-2, Boron 3, cobalt 72, molybdenum 5, titanium 20 (atomic) 431898-46-3, Boron 3, cobalt 77, molybdenum 5, titanium 15 (atomic)  
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)

(longitudinal magnetic **recording** medium and magnetic **recording** app. with high **recording** d., suppressed noise and improved stability)

IT 12735-25-0 207224-28-0, Chromium 10, cobalt 60, zirconium 10 (atomic) 342384-06-9, Chromium 20, nickel 65, zirconium 15 (atomic) **431898-47-4**, Cobalt 40-65, ruthenium 35-60 (atomic) 431898-48-5, Boron, cobalt, ruthenium **431898-49-6**, Cobalt bal., ruthenium 35-60, boron 1-12 (atomic) 431898-50-9, Cobalt bal., chromium 16-22, platinum 12-18, boron 4-12, tantalum 0-3 (atomic)

RL: TEM (Technical or engineered material use); USES (Uses)  
(longitudinal magnetic **recording** medium and magnetic **recording** app. with high **recording** d., suppressed noise and improved stability)

IT **94470-28-7**, Cobalt 60, ruthenium 40 (atomic)

RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(longitudinal magnetic **recording** medium and magnetic **recording** app. with high **recording** d., suppressed noise and improved stability)

IT **77592-17-7**, Cobalt 50, ruthenium 50 (atomic) **120171-63-3**, Cobalt 30, ruthenium 70 (atomic) **153084-87-8**, Cobalt 70, ruthenium 30 (atomic) **273379-93-4**, Cobalt 65, ruthenium 35 (atomic) **412942-25-7**, Cobalt 40, ruthenium 60 (atomic) **412942-26-8**, Boron 1, cobalt 59, ruthenium 40 (atomic) **412942-27-9**, Boron 3, cobalt 57, ruthenium 40 (atomic) **412942-28-0**, Boron 6, cobalt 54, ruthenium 40 (atomic) **412942-29-1**, Boron 12, cobalt 48, ruthenium 40 (atomic) **412942-30-4**, Boron 15, cobalt 45, ruthenium 40 (atomic)

RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)

(longitudinal magnetic **recording** medium and magnetic **recording** app. with high **recording** d., suppressed noise and improved stability)

IT **431898-47-4**, Cobalt 40-65, ruthenium 35-60 (atomic) **431898-49-6**, Cobalt bal., ruthenium 35-60, boron 1-12 (atomic)

RL: TEM (Technical or engineered material use); USES (Uses)  
(longitudinal magnetic **recording** medium and magnetic **recording** app. with high **recording** d., suppressed noise and improved stability)

2002:345865 Document No. 136:362831 Magnetic **recording** medium for high density **recording**. Futamoto, Masaaki; Inaba, Nobuyuki; Hirayama, Yoshiyuki; Takeuchi, Teruaki; Honda, Yukio (Hitachi Ltd., Japan). U.S. US 6383667 B1 20020507, 20 pp. (English). CODEN: USXXAM. APPLICATION: US 1999-413813 19991007. PRIORITY: JP 1998-288134 19981009; JP 1999-45884 19990224.

AB The present invention relates to a magnetic **recording** medium that has a magnetic film suitable for high-d. magnetic **recording**. The magnetic **recording** medium includes a substrate, an underlayer provided on the substrate, a Co alloy magnetic film formed through the underlayer, and a protective film for protecting the magnetic film, in which the underlayer has a 2-layer structure of an lower underlayer contacted with the substrate and an upper underlayer contacted with the Co alloy magnetic film, the upper underlayer is a Co-Crx-My alloy film having a hcp. structure, where 25 at.%  $\leq x+y \leq 50$  at.%, 0.5 at.%  $\leq y$ , and **non-magnetic** element M is selected from the group of elements B, Si, Ge, C, Al, P, Ti, V, Nb, Zr, Hf, Mn, Rh, Os, Ir, Re, Pd, Pt, Mo, Ta, W, Ag and Au. Thereby the medium can be increased in its coercive force and can be improved in its thermal stability characteristics.

IC ICM G11B005-66

ICS G11B005-70

NCL 428694000TS

CC 77-8 (Magnetic Phenomena)

Section cross-reference(s): 56

ST chromium cobalt alloy magnetic **recording** medium

IT Coercive force (magnetic)

Thermal stability

(improvement of; magnetic **recording** medium for high d. **recording**)

IT Magnetic films

**Magnetic recording materials**

(magnetic **recording** medium for high d. **recording**)

IT 1314-23-4, Zirconia, uses 7440-03-1, Niobium, uses 7440-21-3, Silicon, uses 7440-32-6, Titanium, uses 7440-47-3, Chromium, uses 7440-58-6, Hafnium, uses 7440-67-7, Zirconium, uses 7631-86-9, Silica, uses 12381-52-1, Chromium silicide (CrSi<sub>3</sub>) 12797-58-9

RL: TEM (Technical or engineered material use); USES (Uses)

(adhesion layer; magnetic **recording** medium for high d. **recording**)

IT 197803-58-0 421550-46-1 421550-47-2 421550-48-3 421550-49-4

421550-50-7 421550-51-8 421550-52-9 421550-53-0 421550-54-1

421550-55-2 421550-56-3 421550-57-4 421550-58-5 421550-61-0

421550-64-3 421550-67-6 421550-68-7 421550-69-8 421550-70-1

RL: TEM (Technical or engineered material use); USES (Uses)

(film **material**; magnetic **recording** medium for high d. **recording**)

IT 1309-48-4, Magnesium oxide (MgO), uses 7789-24-4, Lithium fluoride

(LiF), uses 11114-55-9 11114-60-6 11114-68-4 11143-56-9

11147-86-7 12682-24-5 39286-82-3 39314-47-1 39460-27-0

51614-60-9 59124-11-7 77592-17-7, Cobalt 50, ruthenium 50

(atomic) 94470-28-7, Cobalt 60, ruthenium 40 (atomic)

147099-05-6, Cobalt 90, ruthenium 10 (atomic) 153084-87-8

160619-62-5, Cobalt 80, ruthenium 20 (atomic) 273379-93-4

, Cobalt 65, ruthenium 35 (atomic) 341036-30-4

366476-02-0 412942-25-7 421550-72-3

421550-73-4 421550-74-5 421550-75-6

421550-76-7 421550-77-8 421550-78-9

421550-79-0 421550-80-3 421550-81-4



421550-82-5 421550-83-6 421550-84-7 421550-85-8  
421550-86-9 421550-87-0 421550-88-1 421550-89-2  
421550-90-5

RL: TEM (Technical or engineered material use); USES (Uses)  
(lower underlayer; magnetic **recording** medium for high d.  
**recording**)

IT 96439-26-8 213332-70-8, Chromium 30, cobalt 66, titanium 4 (atomic)  
323187-06-0, Chromium 30, cobalt 60, manganese 10 (atomic) 421550-28-9  
421550-29-0 421550-30-3 421550-31-4 421550-32-5 421550-33-6  
421550-34-7 421550-35-8 421550-36-9 421550-37-0 421550-39-2  
421550-40-5 421550-41-6 421550-42-7 421550-43-8 421550-44-9  
421550-45-0

RL: TEM (Technical or engineered material use); USES (Uses)  
(magnetic **recording** medium for high d. **recording**)

IT 294626-73-6, Boron 6, chromium 25, cobalt 69 (atomic) 294626-75-8,  
Chromium 25, cobalt 67, silicon 8 (atomic) 294626-77-0, Chromium 25,  
cobalt 65, germanium 10 (atomic) 294626-79-2, Aluminum 4, chromium 25,  
cobalt 71 (atomic) 294626-81-6, Chromium 25, cobalt 69, phosphorus 6  
(atomic) 294626-83-8, Chromium 25, cobalt 69, titanium 6 (atomic)  
294626-85-0, Chromium 25, cobalt 65, vanadium 10 (atomic) 294626-87-2,  
Chromium 25, cobalt 71, zirconium 4 (atomic) 294626-89-4, Chromium 25,  
cobalt 67, niobium 8 (atomic) 294626-91-8, Chromium 25, cobalt 69,  
hafnium 6 (atomic) 294626-93-0, Chromium 25, cobalt 65, manganese 10  
(atomic) 294626-95-2, Chromium 25, cobalt 63, rhodium 12 (atomic)  
294626-97-4, Chromium 25, cobalt 57, iridium 18 (atomic) 294626-99-6,  
Chromium 25, cobalt 61, rhenium 14 (atomic) 294627-01-3, Chromium 25,  
cobalt 67, palladium 8 (atomic) 294627-03-5, Chromium 25, cobalt 69,  
platinum 6 (atomic) 294627-05-7, Chromium 25, cobalt 71, molybdenum 4  
(atomic) 294627-07-9, Chromium 25, cobalt 67, tungsten 8 (atomic)  
294627-09-1, Chromium 25, cobalt 71, silver 4 (atomic) 294627-11-5,  
Chromium 25, cobalt 69, gold 6 (atomic)

RL: TEM (Technical or engineered material use); USES (Uses)  
(upper underlayer; magnetic **recording** medium for high d.  
**recording**)

IT 77592-17-7, Cobalt 50, ruthenium 50 (atomic) 94470-28-7,  
Cobalt 60, ruthenium 40 (atomic) 153084-87-8 160619-62-5  
, Cobalt 80, ruthenium 20 (atomic) 273379-93-4, Cobalt 65,  
ruthenium 35 (atomic) 341036-30-4 366476-02-0  
412942-25-7 421550-72-3 421550-73-4  
421550-74-5 421550-76-7 421550-77-8  
421550-78-9 421550-79-0 421550-80-3  
421550-81-4 421550-83-6 421550-85-8  
421550-86-9 421550-88-1 421550-90-5

RL: TEM (Technical or engineered material use); USES (Uses)  
(lower underlayer; magnetic **recording** medium for high d.  
**recording**)

L83 ANSWER 8 OF 23 HCAPLUS COPYRIGHT 2002 ACS

2002:292134 Document No. 136:334092 Magnetic **recording** medium and  
magnetic memory device. Kamibe, Tetsuya; Yaku, Hiroo; Matsuda, Yoshifumi;  
Inagaki, Yuzuru; Sakamoto, Koji (Hitachi Ltd., Japan). Jpn. Kokai Tokkyo  
Koho JP 2002117531 A2 20020419, 10 pp. (Japanese). CODEN: JKXXAF.  
APPLICATION: JP 2000-313120 20001006.

AB A low-noise and stable magnetic **recording** medium comprises a  
**non-magnetic** substrate, an amorphous or micro-cryst.  
first underlayer, a second underlayer having a body-centered cubic  
structure, a Co-Ru alloy third underlayer having a hexagonal dense  
structure, and a magnetic layer on the third underlayer. Addnl., the  
third underlayer may contain B. A magnetic memory device having the above  
medium is also described.

IC ICM G11B005-738  
ICS C23C014-06; G11B005-65; H01F010-30  
CC 77-8 (Magnetic Phenomena)  
ST magnetic **recording** app cobalt ruthenium alloy underlayer  
IT Magnetic memory devices  
(Co-Ru alloy underlayer in magnetic **recording** medium and  
magnetic memory device)  
IT 273379-93-4  
RL: DEV (Device component use); USES (Uses)  
(CCo-Ru alloy underlayer in magnetic **recording** medium and  
magnetic memory device)  
IT 7440-47-3, Chromium, uses 12735-25-0 77592-17-7 79665-67-1  
94470-28-7 108801-62-3 109375-39-5 110431-79-3  
120171-63-3 153084-87-8 153929-41-0 153929-42-1  
167498-56-8 308356-82-3 353474-74-5 412942-08-6 412942-09-7  
412942-10-0 412942-11-1 412942-12-2 412942-13-3 412942-14-4  
412942-15-5 412942-16-6 412942-17-7 412942-18-8 412942-19-9  
412942-20-2 412942-21-3 412942-22-4 412942-24-6 412942-25-7  
412942-26-8 412942-27-9 412942-28-0  
412942-29-1 412942-30-4 412942-31-5 412942-32-6  
412942-33-7 412942-34-8 412942-36-0 412942-37-1 412942-38-2  
412942-39-3 412942-40-6  
RL: DEV (Device component use); USES (Uses)  
(Co-Ru alloy underlayer in magnetic **recording** medium and  
magnetic memory device)  
IT 273379-93-4  
RL: DEV (Device component use); USES (Uses)  
(CCo-Ru alloy underlayer in magnetic **recording** medium and  
magnetic memory device)  
IT 77592-17-7 94470-28-7 120171-63-3  
153084-87-8 412942-25-7 412942-26-8  
412942-27-9 412942-28-0 412942-29-1  
412942-30-4 412942-40-6  
RL: DEV (Device component use); USES (Uses)  
(Co-Ru alloy underlayer in magnetic **recording** medium and  
magnetic memory device)  
L83 ANSWER 9 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
2002:292133 Document No. 136:334091 Magnetic **recording** medium.  
Inaba, Nobuyuki; Kirino, Fumiyoshi; Kanda, Tetsunori; Matsunuma, Satoru;  
Mizumura, Tetsuo; Takeuchi, Teruaki (Hitachi Maxell Ltd., Japan). Jpn.  
Kokai Tokkyo Koho JP 2002117530 A2 20020419, 13 pp. (Japanese). CODEN:  
JKXXAF. APPLICATION: JP 2000-308930 20001010.  
AB A high-d. magnetic **recording** medium comprises a non-  
magnetic substrate, .gtoreq.2 underlayers, .gtoreq.1 of which is  
formed by ECR sputtering, on the substrate, and a magnetic layer on the  
underlayers. Specifically, the underlayers may comprise MgO, a Ni-Al  
2-component alloy, Ni-Al 3-component alloy, Cr, or Cr alloy contg. V, Mo,  
W, Nb, Ti, Ta, Ru, Zr, and/or Hf.  
IC ICM G11B005-738  
ICS C23C014-06; C23C014-34; G11B005-65; G11B005-851; H01F010-26;  
H01F010-30; H01F041-18  
CC 77-8 (Magnetic Phenomena)  
ST magnetic **recording** app sputter deposited film  
IT Magnetic memory devices  
(sputter deposited underlayer in magnetic **recording** medium)  
IT Films  
(sputter-deposited; sputter deposited underlayer in magnetic  
**recording** medium)  
IT Chromium alloy, base

- RL: DEV (Device component use); USES (Uses)  
(sputter deposited underlayer in magnetic **recording** medium)
- IT 1309-48-4, Magnesium oxide (MgO), uses 7440-47-3, Chromium, uses  
11114-68-4 12682-24-5 174321-15-4, Chromium 85, titanium 15 (atomic)  
177408-82-1, Chromium 19, cobalt 68, platinum 13 (atomic) 321863-03-0  
**342386-46-3**, Chromium 25, cobalt 55, ruthenium 20 (atomic)  
412931-57-8 412931-58-9 412931-59-0  
RL: DEV (Device component use); USES (Uses)  
(sputter deposited underlayer in magnetic **recording** medium)
- IT **342386-46-3**, Chromium 25, cobalt 55, ruthenium 20 (atomic)  
RL: DEV (Device component use); USES (Uses)  
(sputter deposited underlayer in magnetic **recording** medium)
- L83 ANSWER 10 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
2002:292132 Document No. 136:334090 Magnetic **recording** medium.  
Inaba, Nobuyuki; Kirino, Fumiyoshi; Matsunuma, Satoru; Kanda, Tetsunori;  
Mizumura, Tetsuo; Takeuchi, Teruaki (Hitachi Maxell Ltd., Japan). Jpn.  
Kokai Tokkyo Koho JP 2002117529 A2 20020419, 13 pp. (Japanese). CODEN:  
JKXXAF. APPLICATION: JP 2000-308866 20001010.
- AB A high-d. magnetic **recording** medium having a low S/  
N ratio comprises a ferromagnetic **layer** on a  
non-magnetic substrate, first, second, and third  
successive underlayers on the ferromagnetic **layer**, and a  
magnetic **recording layer** on the underlayers.  
Specifically, the ferromagnetic **layer** may comprise a Co alloy  
contg. .gtoreq. 1 of Pt, Pd, Rh, B, Si, Cr, Ru, Zr, Ta, Nb, and V,  
particles of Co, Fe, and/or Ni oxide(s) surrounded with Si oxide, Ti  
oxide, Zn oxide, and/or Ta oxide, or .gtoreq. 2 of Co, Ni, Si, Al, Ta, Ti,  
Zr, Nb, and Fe. Optionally, the underlayers and **recording**  
**layer** may comprise an epitaxial **film**.
- IC ICM G11B005-738  
ICS C23C014-06; G11B005-65; G11B005-66; G11B005-851; H01F010-16;  
H01F010-18; H01F010-30
- CC 77-8 (Magnetic Phenomena)  
ST magnetic **recording** app ferromagnetic epitaxial **film**  
IT Epitaxial **films**  
Ferromagnetic **films**  
Magnetic memory devices  
(ferromagnetic **film** and underlayers in magnetic  
**recording** medium)
- IT Cobalt alloy, base  
RL: DEV (Device component use); USES (Uses)  
(ferromagnetic **film** and underlayers in magnetic  
**recording** medium)
- IT 1313-99-1, Nickel oxide, uses 1314-13-2, Zinc oxide, uses 1314-61-0,  
Tantalum oxide 1332-37-2, Iron oxide, uses 7631-86-9, Silica, uses  
11104-61-3, Cobalt oxide 11114-68-4 12682-24-5 13463-67-7, Titanium  
oxide, uses 142295-96-3 174321-15-4, Chromium 85, titanium 15 (atomic)  
177408-82-1, Chromium 19, cobalt 68, platinum 13 (atomic) 212334-78-6,  
Chromium 19, cobalt 69, platinum 12 (atomic) 321863-03-0  
**342386-46-3**, Chromium 25, cobalt 55, ruthenium 20 (atomic)  
412927-91-4  
RL: DEV (Device component use); USES (Uses)  
(ferromagnetic **film** and underlayers in magnetic  
**recording** medium)
- IT **342386-46-3**, Chromium 25, cobalt 55, ruthenium 20 (atomic)  
RL: DEV (Device component use); USES (Uses)  
(ferromagnetic **film** and underlayers in magnetic  
**recording** medium)

L83 ANSWER 11 OF 23 HCAPLUS COPYRIGHT 2002 ACS

2002:104762 Document No. 136:160200 Perpendicular magnetic **recording** medium and apparatus for reproducing of **recorded** information. Nakamura, Futoshi; Hikosaka, Kazushi; Oikawa, Soichi (Toshiba Corp., Japan). Jpn. Kokai Tokkyo Koho JP 2002042318 A2 20020208, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-219447 20000719.

AB The medium has a **nonmagnetic** support, a soft magnetic layer comprising alternately **laminated** .ltoreq.500-.ANG. soft magnetic layers and **nonmagnetic** layers on the support, and a perpendicular magnetic **recording** layer on the **laminated** layer. A **laminate** of a **nonmagnetic** substrate, a **nonmagnetic** thin intermediate layer, and a Fe-Al-Si alloy soft magnetic layer is also claimed. The app. has the above medium, a means of supporting and driving of rotation of the medium, a device for **recording** on the medium, a magnetic head for reprodn. of the **recorded** information, and a carriage assembly that supports the head and allows free movement of the head against the **recording** medium. The medium allows high-d. **recording** with low noise.

IC ICM G11B005-667

CC ICS G11B005-64; G11B005-738; H01F010-14; H01F010-16; H01F010-30 77-8 (Magnetic Phenomena)

Section cross-reference(s): 56

ST perpendicular magnetic **recording** medium; magnetic **recording** reproducing head low noise; thin soft magnetic layer **laminate**

IT **Magnetic recording materials**

(perpendicular **magnetic recording** medium having **laminate** of soft thin magnetic layers and **nonmagnetic** layers)

IT Magnetic memory devices

(perpendicular magnetic **recording** medium having **laminate** of soft thin magnetic layers and **nonmagnetic** layers in)

IT 7440-44-0, Carbon, uses 93511-57-0

RL: TEM (Technical or engineered material use); USES (Uses) (**nonmagnetic** layer; in perpendicular magnetic **recording** medium having **laminate** of soft thin magnetic layers and **nonmagnetic** layers)

IT 189817-15-0, Chromium cobalt platinum oxide

RL: TEM (Technical or engineered material use); USES (Uses) (**recording** layer; perpendicular magnetic **recording** medium having **laminate** of soft thin magnetic layers and **nonmagnetic** layers)

IT 11122-26-2

RL: TEM (Technical or engineered material use); USES (Uses) (soft magnetic layer; perpendicular magnetic **recording** medium having **laminate** of soft thin magnetic layers and **nonmagnetic** layers)

IT 394208-53-8, Aluminum 11, carbon 0-17, chromium 16, cobalt 0-17, iron bal., platinum 20, ruthenium 0-17, silicon 0-17, titanium 0-17 (atomic)

RL: TEM (Technical or engineered material use); USES (Uses) (sputtering target; for prepn. of perpendicular magnetic **recording** medium having **laminate** of soft thin magnetic layers and **nonmagnetic** layers)

IT 394208-53-8, Aluminum 11, carbon 0-17, chromium 16, cobalt 0-17, iron bal., platinum 20, ruthenium 0-17, silicon 0-17, titanium 0-17 (atomic)

RL: TEM (Technical or engineered material use); USES (Uses) (sputtering target; for prepn. of perpendicular magnetic

**recording** medium having **laminate** of soft thin magnetic layers and **nonmagnetic** layers)

L83 ANSWER 12 OF 23 HCAPLUS COPYRIGHT 2002 ACS

2001:745602 Document No. 135:297466 Perpendicular magnetic **recording** medium involving ruthenium alloy underlayer and magnetic **recording** apparatus. Oikawa, Soichi; Hikosaka, Kazushi (Toshiba Corp., Japan). Jpn. Kokai Tokkyo Koho JP 2001283428 A2 20011012, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-94552 20000330.

AB The **recording** medium has a **nonmagnetic** support, an underlayer on the support, a magnetic layer on the underlayer, and a protective layer on the magnetic layer wherein the magnetic layer is made of a Co-based alloy and the underlayer is made of an alloy based on .gtoreq.60 at.% Ru and a body-centered cubic material. Alternatively, the medium involves a double layer underlayer comprising a Ti (alloy or compd.) layer and the Ru alloy layer. The **recording** medium shows reduced noise. The **recording** app. involves the magnetic **recording** medium, a means of supporting of the medium and of driving rotation of the medium, a means of **recording** information on the medium and of reproducing information from the medium, and a means of supporting the **recording** means.

IC ICM G11B005-738

ICS G11B005-64; G11B005-66

CC 77-8 (Magnetic Phenomena)

Section cross-reference(s): 56

ST perpendicular magnetic **recording** medium underlayer; cobalt alloy magnetic **recording** medium; ruthenium alloy underlayer magnetic **recording** medium; bcc material alloy; noise reduced magnetic **recording** medium app

IT **Magnetic disks**

Magnetic memory devices

(perpendicular **magnetic recording** medium involving ruthenium alloy underlayer with reduced noise for magnetic **recording** app.)

IT Magnetic materials

(soft; in perpendicular magnetic **recording** medium involving ruthenium alloy underlayer with reduced noise for magnetic **recording** app.)

IT Glass, uses

RL: DEV (Device component use); USES (Uses)

(support; in perpendicular magnetic **recording** medium involving ruthenium alloy underlayer with reduced noise for magnetic **recording** app.)

IT 93511-57-0

RL: DEV (Device component use); USES (Uses)

(intermediate layer; in perpendicular magnetic **recording** medium involving ruthenium alloy underlayer with reduced noise for magnetic **recording** app.)

IT. 189817-15-0, Chromium cobalt platinum oxide

RL: DEV (Device component use); USES (Uses)

(magnetic; perpendicular magnetic **recording** medium involving ruthenium alloy underlayer with reduced noise for magnetic **recording** app.)

IT **365403-56-1 365403-57-2**

RL: PEP (Physical, engineering or chemical process); PROC (Process)

(sputtering target; for prepn. of perpendicular magnetic **recording** medium involving ruthenium alloy underlayer with reduced noise)

IT 7440-32-6, Titanium, uses 25583-20-4, Titanium nitride 59124-09-3

RL: DEV (Device component use); TEM (Technical or engineered material

- use); USES (Uses)  
(underlayer; perpendicular magnetic **recording** medium  
involving ruthenium alloy underlayer with reduced noise for magnetic  
**recording** app.)
- IT 365403-56-1 365403-57-2  
RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(sputtering target; for prepn. of perpendicular magnetic  
**recording** medium involving ruthenium alloy underlayer with  
reduced noise)
- L83 ANSWER 13 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
2001:635676 Document No. 135:204301 Durable magnetic **recording**  
media possessing chromium alloy-based **nonmagnetic** underlayers  
and their manufacture. Uesumi, Hiroyuki; Oikawa, Tadaaki (Fuji Electric  
Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2001236636 A2 20010831, 7  
pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-46472 20000223.
- AB The media, esp. suited for external memory devices of computers, comprise  
plastic supports, Cr alloy-based **nonmagnetic** underlayers,  
Co-based **recording** layers, protective layers, and liq. lubricant  
layers, where the Cr alloys contain (i) .gtoreq.15 at.% Zr, Nb, Mo, Ru,  
and/or Pd or (ii) .gtoreq.10 at.% Hf, Ta, W, Re, Pt, and/or Au and show  
bcc crystal structure. The underlayers are manufd. by sputtering under  
.ltoreq.30 (suitably .ltoreq.15) mTorr gas pressure. The media suppressed  
elution of Co to the surfaces and showed excellent wear resistance.
- IC ICM G11B005-738  
ICS C23C014-34; G11B005-64; G11B005-851
- CC 77-8 (Magnetic Phenomena)  
Section cross-reference(s): 56
- ST magnetic **recording** medium chromium alloy underlayer; bcc  
structured chromium alloy magnetic medium; sputtering chromium alloy  
underlayer magnetic media; cobalt elution suppression magnetic memory  
device
- IT Crystal structure types  
(bcc.; durable magnetic **recording** media possessing  
bcc-structured sp. Cr alloy underlayers for computer memory devices)
- IT Magnetic memory devices  
**Magnetic recording materials**  
Sputtering  
(durable magnetic **recording** media possessing  
bcc-structured sp. Cr alloy underlayers for computer memory devices)
- IT Polyethers, processes  
RL: DEV (Device component use); PEP (Physical, engineering or chemical  
process); PROC (Process); USES (Uses)  
(perfluoro, outermost lubricant layers; durable magnetic  
**recording** media possessing bcc-structured sp. Cr alloy  
underlayers for computer memory devices)
- IT Fluoropolymers, processes  
RL: DEV (Device component use); PEP (Physical, engineering or chemical  
process); PROC (Process); USES (Uses)  
(polyether-, outermost lubricant layers; durable magnetic  
**recording** media possessing bcc-structured sp. Cr alloy  
underlayers for computer memory devices)
- IT Polycarbonates, properties  
RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(supports; durable magnetic **recording** media possessing  
bcc-structured sp. Cr alloy underlayers for computer memory devices)
- IT 7440-44-0, Carbon, processes  
RL: DEV (Device component use); PEP (Physical, engineering or chemical  
process); PROC (Process); USES (Uses)  
(protective layers; durable magnetic **recording** media

- possessing bcc-structured sp. Cr alloy underlayers for computer memory devices)
- IT 356057-03-9  
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(**recording** layers; durable magnetic **recording** media  
possessing bcc-structured sp. Cr alloy underlayers for computer memory devices)
- IT 119036-83-8 **123590-45-4**, Chromium 85, ruthenium 15 (atomic)  
124798-68-1, Chromium 85, molybdenum 15 (atomic) 124798-69-2, Chromium 75, molybdenum 25 (atomic) 207224-36-0, Chromium 85, zirconium 15 (atomic) 225798-98-1, Chromium 90, tungsten 10 (atomic) 241826-25-5, Chromium 90, tantalum 10 (atomic) 356056-98-9 356056-99-0  
356057-00-6 356057-01-7 356057-02-8  
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)  
(underlayers; durable magnetic **recording** media possessing bcc-structured sp. Cr alloy underlayers for computer memory devices)
- IT **123590-45-4**, Chromium 85, ruthenium 15 (atomic)  
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)  
(underlayers; durable magnetic **recording** media possessing bcc-structured sp. Cr alloy underlayers for computer memory devices)
- L83 ANSWER 17 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
2000:876843 Document No. 134:50487 Magnetic **recording** medium, magnetic **storage** apparatus, **recording** method and method of producing magnetic **recording** medium. Abarra, E. Noel; Okamoto, Iwao; Mizoshita, Yoshifumi; Yoshida, Yuki; Umeda, Hisashi; Suzuki, Masaya; Akimoto, Hideyuki; Sato, Hisateru; Kaitsu, Isatake (Fujitsu Limited, Japan). Eur. Pat. Appl. EP 1059629 A2 20001213, 57 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW. APPLICATION: EP 2000-304517 20000526. PRIORITY: JP 1999-161329 19990608; JP 2000-107075 20000407; JP 2000-107071 20000407; JP 2000-107076 20000407; JP 2000-107074 20000407; JP 2000-107072 20000407.
- AB A magnetic **recording** medium is provided with at least one exchange layer structure, and a magnetic layer (9) formed on the exchange layer structure. The exchange layer structure includes a ferromagnetic layer (7) and a **nonmagnetic** coupling layer (8) provided on the ferromagnetic layer (7) and under the magnetic layer (9).
- IC G11B005-00; G11B005-02; G11B005-64  
CC 77-8 (Magnetic Phenomena)  
Section cross-reference(s): 55, 56
- ST **magnetic recording material**  
**multilayer** alloy
- IT Electronic device fabrication  
Ferromagnetic films  
Magnetic films  
Magnetic memory devices  
Magnetic **multilayers**  
**Magnetic recording materials**  
(**magnetic recording** medium, **magnetic storage** app., **recording** method and method of producing magnetic **recording** medium)
- IT Ceramics  
(**magnetic recording** medium, **magnetic storage** app., **recording** method and method of producing magnetic **recording** medium using)
- IT Oxides (inorganic), processes

RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
(magnetic **recording** medium, magnetic **storage** app.,  
**recording** method and method of producing magnetic  
**recording** medium using)

IT Chromium alloy, base  
Cobalt alloy, base  
Copper alloy, base  
Iridium alloy, base  
Iron alloy, base  
Nickel alloy, base

**Ruthenium alloy, base**

RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
(magnetic **recording** medium, magnetic **storage** app.,  
**recording** method and method of producing magnetic  
**recording** medium)

IT 7439-88-5, Iridium, processes 7440-16-6, Rhodium, processes 7440-18-8,  
Ruthenium, processes 11134-15-9 12715-58-1 12735-25-0 59124-09-3  
66993-02-0 77325-66-7 92839-06-0 137850-97-6 159744-62-4  
177899-00-2 197587-27-2, Chromium 37, cobalt 63 (atomic)  
**261352-06-1**, Cobalt 20, ruthenium 80 (atomic) **312602-06-5**  
, Chromium 20, ruthenium 80 (atomic) **312602-09-8**, Iron 20,  
ruthenium 80 (atomic) **312602-11-2**, Manganese 20, ruthenium 80  
(atomic) **312602-14-5**, Nickel 10, ruthenium 90 (atomic)  
312602-17-8, Chromium 95, molybdenum 2.5, tungsten 2.5 (atomic)  
312602-21-4, Chromium 80, molybdenum 10, tungsten 10 (atomic)  
312602-24-7, Boron 4, chromium 22, cobalt 63, platinum 11 (atomic)  
312602-29-2, Chromium, cobalt base, molybdenum, platinum 312602-32-7,  
Chromium, cobalt base, niobium, platinum 312602-36-1, Chromium, cobalt  
base, platinum, tungsten 312602-41-8, Chromium, cobalt base, copper,  
platinum **312602-45-2**, Cobalt 50-100, ruthenium 0-50 (atomic)  
**312602-49-6**, Chromium 50-100, ruthenium 0-50 (atomic)  
**312602-55-4**, Iron 0-60, ruthenium 40-100 (atomic)  
**312602-61-2**, Nickel 0-10, ruthenium 90-100 (atomic)  
**312602-69-0**, Manganese 0-50, ruthenium 50-100 (atomic)

RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
(magnetic **recording** medium, magnetic **storage** app.,  
**recording** method and method of producing magnetic  
**recording** medium)

IT **261352-06-1**, Cobalt 20, ruthenium 80 (atomic) **312602-06-5**  
, Chromium 20, ruthenium 80 (atomic) **312602-09-8**, Iron 20,  
ruthenium 80 (atomic) **312602-11-2**, Manganese 20, ruthenium 80  
(atomic) **312602-14-5**, Nickel 10, ruthenium 90 (atomic)  
**312602-45-2**, Cobalt 50-100, ruthenium 0-50 (atomic)  
**312602-49-6**, Chromium 50-100, ruthenium 0-50 (atomic) **312602-55-4**,  
Iron 0-60, ruthenium 40-100 (atomic) **312602-61-2**,  
Nickel 0-10, ruthenium 90-100 (atomic) **312602-69-0**, Manganese  
0-50, ruthenium 50-100 (atomic)

RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
(magnetic **recording** medium, magnetic **storage** app.,  
**recording** method and method of producing magnetic  
**recording** medium)

L83 ANSWER 18 OF 23 HCAPLUS COPYRIGHT 2002 ACS

1999:756134 Document No. 131:345578 Magnetic **recording** medium and  
Cr-Ru sputtering target.. Ueno, Tomonori (Hitachi Metals, Ltd., Japan).  
Jpn. Kokai Tokkyo Koho JP 11328648 A2 19991130 Heisei, 4 pp. (Japanese).



CODEN: JKXXAF. APPLICATION: JP 1998-129800 19980513.

- AB In a magnetic **recording** medium comprising a Co-based magnetic layer formed on a **non-magnetic** substrate via an underlayer, the underlayer comprises Ru 5-18 at% and Cr balance. A sintered sputtering target comprises Ru 5-18 at% and Cr balance. A high-d. medium having a low noise is obtained.
- IC ICM G11B005-66  
ICS C22C027-06; C23C014-34
- CC 77-8 (Magnetic Phenomena)  
Section cross-reference(s): 75
- ST magnetic **recording** medium chromium ruthenium alloy sputtering target
- IT Magnetic memory devices  
Sputtering targets  
(magnetic **recording** medium and Cr-Ru sputtering target)
- IT 122844-03-5, Chromium 90, ruthenium 10 (atomic) **123590-45-4**, Chromium 85, ruthenium 15 (atomic)  
RL: DEV (Device component use); USES (Uses)  
(magnetic **recording** medium and Cr-Ru sputtering target)
- IT **123590-45-4**, Chromium 85, ruthenium 15 (atomic)  
RL: DEV (Device component use); USES (Uses)  
(magnetic **recording** medium and Cr-Ru sputtering target)
- L83 ANSWER 19 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
1998:811821 Document No. 130:104122 Magnetic **recording** medium for high-density **recording**. Futamoto, Masaaki; Inaba, Nobuyuki; Yamanaka, Ichisuke; Ito, Akinari; Honda, Yukio (Hitachi, Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 10334444 A2 19981218 Heisei, 8 pp. (Japanese).  
CODEN: JKXXAF. APPLICATION: JP 1997-141763 19970530.
- AB The **recording** medium has a **nonmagnetic** substrate, .gtoreq.2 undercoat layers, a magnetic layer having hexagonal closest packed structure, and a protective film **laminated** in thin order. In the **recording** medium, the magnetic layer comprises a polycryst. Co base alloy contg. .gtoreq.1 **nonmagnetic** element having av. crystal grain size 5-15 nm and the alloy contains .gtoreq.25 at.% segregation layer of the **nonmagnetic** element in the crystal grain boundary. The 1st undercoat layer in contact with the magnetic layer is a **nonmagnetic** layer having hexagonal closest packed structure or a weak magnetic layer having satd. magnetization .ltoreq.100 emu/mL and the 2nd undercoat layer formed on the substrate has bcc. or NaCl-type structure and predominant orientation in <100> or <211> direction.
- IC ICM G11B005-66  
ICS H01F010-12
- CC 77-8 (Magnetic Phenomena)  
Section cross-reference(s): 56
- ST magnetic **recording** medium undercoat layer; cobalt alloy magnetic **recording** medium
- IT **Magnetic disks**  
**Magnetic recording materials**  
(high-d. magnetic **recording** medium having .gtoreq.2 undercoat layers and Co-base alloy magnetic layer)
- IT 57720-36-2, Chromium 45, cobalt 55 (atomic) **94470-28-7**, Cobalt 60, ruthenium 40 (atomic) 147856-89-1, Chromium 36, cobalt 64 (atomic) **219547-78-1** 219547-83-8  
RL: DEV (Device component use); USES (Uses)  
(1st undercoat layer; high-d. magnetic **recording** medium having .gtoreq.2 undercoat layers and Co-base alloy magnetic layer)
- IT 1309-48-4, Magnesium oxide (MgO), uses 7440-47-3, Chromium, uses 7789-24-4, Lithium fluoride (LiF), uses 174321-15-4, Chromium 85,

titanium 15 (atomic)  
RL: DEV (Device component use); USES (Uses)  
(2nd undercoat layer; high-d. magnetic **recording** medium  
having .gtoreq.2 undercoat layers and Co-base alloy magnetic layer)  
IT 212334-78-6, Chromium 19, cobalt 69, platinum 12 (atomic) 219547-80-5  
219547-82-7 219547-84-9  
RL: DEV (Device component use); USES (Uses)  
(magnetic; high-d. magnetic **recording** medium having .gtoreq.2  
undercoat layers and Co-base alloy magnetic layer)  
IT **94470-28-7**, Cobalt 60, ruthenium 40 (atomic) **219547-78-1**  
RL: DEV (Device component use); USES (Uses)  
(1st undercoat layer; high-d. magnetic **recording** medium  
having .gtoreq.2 undercoat layers and Co-base alloy magnetic layer)

L83 ANSWER 23 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
1985:55332 Document No. 102:55332 Magnetic **recording** medium.  
(Nippon Telegraph and Telephone Public Corp., Japan). Jpn. Kokai Tokkyo  
Koho JP 59154635 A2 19840903 Showa, 4 pp. (Japanese). CODEN: JKXXAF.  
APPLICATION: JP 1983-27802 19830223.

AB A magnetic **recording** structure consists of a Co alloy thin film  
on a substrate. The Co alloy contains Cr, Ru, Fe, and/or Os and is a hcp.  
ferromagnetic film with its c-axis perpendicular to the substrate. The Co  
alloy is formed on a substrate via a **nonmagnetic** underlayer.  
Optionally, the underlay may consist of a similar Co alloy.

IC G11B005-70; H01F010-30  
CC 79-3 (Inorganic Analytical Chemistry)  
ST chromium alloy perpendicular magnetic **recording**  
IT Glass, oxide  
RL: ANST (Analytical study)  
(**magnetic disk** support from)  
IT Sputtering  
(of cobalt alloys from magnetic **recording** devices)  
IT **Recording materials**  
(**magnetic**, cobalt alloys, for **disks** and  
**tapes**)  
IT **Recording apparatus**  
(**magnetic**, **disks**, sputtering in fabrication of)  
IT **Recording apparatus**  
(**magnetic**, **tapes**, sputtering in fabrication of)  
IT Cobalt alloy, base  
RL: ANST (Analytical study)  
(magnetic **recording** structures from sputtering of)  
IT 11114-92-4 12646-82-1 12735-25-0 52973-73-6 57139-85-2  
94470-25-4 94470-26-5 **94470-27-6 94470-28-7**  
94470-29-8 94470-30-1 **94470-31-2** 94470-32-3  
**94470-33-4**  
RL: ANST (Analytical study)  
(magnetic **recording** structures from sputtering of)  
IT **94470-27-6 94470-28-7 94470-31-2**  
**94470-33-4**  
RL: ANST (Analytical study)  
(magnetic **recording** structures from sputtering of)

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L93 ANSWER 1 OF 11 HCAPLUS COPYRIGHT 2002 ACS  
2001:356597 Document No. 134:360588 Magnetic **recording** medium, and  
magnetic **recording** apparatus. Kirino, Fumio; Inaba, Nobuyuki;  
Takeuchi, Teruaki; Soya, Tomoko; Mizumura, Tetsuo; Wakabayashi, Koichiro;

Sakamoto, Harumi; Onuma, Takeshi (Hitachi Maxell, Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2001134930 A2 20010518, 15 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1999-316322 19991108.

AB A magnetic **recording** medium or app. suitable for low-noise and high-d. **recording** is described, which comprises a rigid substrate, underlayer on the substrate, a control layer of magnesia, a Cr alloy, or Ni alloy on the underlayer, and a magnetic **recording** layer on the control layer. The underlayer comprises hexagonal cryst. particles of an oxide(s) of Co, Cr, Fe, and/or Ni and grain boundaries of silica, **alumina**, titania, **Ta oxide**, and/or Zn oxide, and has a honeycomb structure of the cryst. particles in the plane parallel to the substrate. Specifically, the control layer may comprise an epitaxial film, and the combination of the underlayer, control layer, and magnetic layer may comprise CoO-**SiO2**/MgO/Co-Cr-Pt-Ta alloy, CoO-**SiO2**/Cr-W alloy/Co-Cr-Pt-Ta alloy, CoO-**SiO2**/MgO/Co-**SiO2** granular magnetic film, CoO-**SiO2**/Ni-Al alloy/Co-Cr-Pt-Ta alloy, CoO-**SiO2**/Cr-Ti alloy/Co-Cr-Pt-Ta alloy, CoO-**SiO2**/Ni-Ta alloy/Co-Pt-**SiO2** granular magnetic film, CoO-**SiO2**/Ni-Ta alloy/Co-Cr-Pt-Ta alloy, CoO-**SiO2**/Cr-Ru alloy/Co-Cr-Pt-Ta alloy, CoO-**SiO2**/Cr-Ru alloy/Co-Pt-**SiO2** granular magnetic film, CoO-**SiO2**/Co-Cr-Zr alloy/Co-Pt-**SiO2** granular magnetic film, CoO-**SiO2**/Co-Cr-Zr alloy/Co-Cr-Pt-Ta alloy, CoO-**SiO2**/Cr-Mo alloy/Co-Cr-Pt-Ta alloy, and/or CoO-**SiO2**/Cr-Mo alloy/Co-Pt-**SiO2** granular magnetic film.

IC ICM G11B005-738

ICS G11B005-64

CC 77-8 (Magnetic Phenomena)

ST magnetic **recording** app **multilayer** film

IT **Magnetic disks**

(magnetic **recording** medium, and magnetic **recording** system)

IT Epitaxial films

Magnetic films

Magnetic memory devices

(**multilayer** films in magnetic **recording** medium, and magnetic **recording** system)

IT Films

(**multilayer**; **multilayer** films in magnetic **recording** medium, and magnetic **recording** system)

IT Chromium alloy, base

Nickel alloy, base

RL: DEV (Device component use); USES (Uses)

(**multilayer** films in magnetic **recording** medium, and magnetic **recording** system)

IT 1307-96-6, Cobaltous oxide, uses 1314-13-2, Zinc oxide, uses

1314-61-0, **Tantalum oxide** 1344-28-1, Alumina, uses

7440-06-4, Platinum, uses 7440-48-4, Cobalt, uses 7631-86-9, Silica,

uses 11114-68-4 12682-24-5 13463-67-7, Titania, uses 39314-47-1

56293-97-1 **59124-09-3** 59124-11-7 68394-23-0 312588-10-6,

Chromium 18, cobalt 69, platinum 10, tantalum 3 (atomic)

RL: DEV (Device component use); USES (Uses)

(**multilayer** films in magnetic **recording** medium, and magnetic **recording** system)

IT **59124-09-3**

RL: DEV (Device component use); USES (Uses)

(**multilayer** films in magnetic **recording** medium, and magnetic **recording** system)

L93 ANSWER 2 OF 11 HCAPLUS COPYRIGHT 2002 ACS

- 1996:409706 Document No. 125:74515 **Multilayered** soft magnetic film with good corrosion resistance. Hasegawa, Naoya (Alps Electric Co Ltd, Japan). Jpn. Kokai Tokkyo Koho JP 08097034 A2 19960412 Heisei, 9 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1994-228513 19940922.
- AB The film consists of an alternative **laminate** of an FeX (X = Al, Si, Cr, Ru, Rh, Pd, Re, and/or Au) 1st magnetic layer comprising an FeX alloy solid soln. crystal having a body-centered cubic structure with av. crystal particle size .ltoreq.40 nm and an FeXMC (M = Ti, Zr, Hf, V, Nb, Ta, Mo, and/or W) 2nd magnetic layer comprising an FeX alloy solid soln. crystal having a body-centered cubic structure with av. particle size .ltoreq.40 nm and M carbide particles with av. crystal particle size .ltoreq.10 nm. The film showed high magnetic permeability and satn. magnetic flux d., low coercive force, and good corrosion and heat resistance.
- IC ICM H01F010-14
- CC 77-8 (Magnetic Phenomena)  
Section cross-reference(s): 55
- ST iron alloy magnetic **multilayered** film; corrosion resistance iron alloy magnetic
- IT **Magnetic substances**  
(**multilayered** soft magnetic iron alloy film with good corrosion resistance)
- IT 12648-20-3P 37310-13-7P 39307-99-8P 53805-34-8P 59123-72-7P  
68837-32-1P 111178-54-2P 123460-06-0P 123929-44-2P 160379-03-3P  
178406-98-9P 178406-99-0P 178407-00-6P 178407-01-7P 178407-02-8P  
178407-03-9P 178407-04-0P 178407-05-1P 178407-06-2P 178407-07-3P  
178407-08-4P 178407-09-5P 178407-10-8P 178407-11-9P  
**178407-12-0P 178407-13-1P** 178407-14-2P 178407-15-3P  
178407-16-4P 178407-17-5P 178407-18-6P 178407-19-7P  
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(**multilayered** soft magnetic iron alloy film with good corrosion resistance)
- IT 11129-37-6P, Hafnium carbide 11130-21-5P, Vanadium carbide  
11130-73-7P, Tungsten carbide 12069-94-2P, Niobium carbide  
12070-08-5P, **Titanium carbide** 12627-57-5P,  
Molybdenum carbide 51680-51-4P, **Tantalum carbide**  
51680-56-9P, Zirconium carbide  
RL: PNU (Preparation, unclassified); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(**multilayered** soft magnetic iron alloy film with good corrosion resistance)
- IT **178407-12-0P 178407-13-1P**  
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(**multilayered** soft magnetic iron alloy film with good corrosion resistance)
- L93 ANSWER 3 OF 11 HCAPLUS COPYRIGHT 2002 ACS
- 1995:475899 Document No. 122:254464 Soft magnetic iron alloy film and magnetic head using it. Shoji, Mitsuharu; Oomori, Hiroyuki; Katori, Kenji; Hayashi, Kazuhiko (Sony Corp, Japan). Jpn. Kokai Tokkyo Koho JP 07022237 A2 19950124 Heisei, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1993-159227 19930629.
- AB The film is obtained by **laminating** (A) (FeaRubGacSid)xOyNzCw (a = 68-90; b = 0.1-10; c = 0.1-15; d = 10-25; x = 80-100; yr = 0-20; z = 0-20; w = 0-20; a + b + c + d = 100; x + y + z + w = 100 at.%) soft magnetic thin film on an underlayer consisting of (a) Ta, Nb, Zr, Ti, Al, Cr, Mo, W, Pt, Au, Pd, Ag, and/or V or (b) **nitrides** of **Al, Si, Ta, Zr, Nb, and/or B** or (B)

(FeaRubGacSid)xOyNzCw thin film and an interlayer insulating layer via metal layer of Ta, Nb, Zr, Ti, Al, Cr, Mo, W, Pt, Au, Pd, Ag, and/or V. The magnetic head has the film as a part of **magnetic cores**. The film showed good interlayer adhesion and soft magnetic characteristics after high-temp. heating.

IC ICM H01F010-14

ICS C22C038-00; C23C014-06; G11B005-147; G11B005-31; H01F041-18

CC 77-8 (Magnetic Phenomena)

Section cross-reference(s): 55

IT **Magnetic cores**

(soft **magnetic** iron alloy thin film and magnetic head)

IT **Recording materials**

(**magnetic**, soft **magnetic** iron alloy thin film and magnetic head)

IT **Recording apparatus**

(magnetic heads, soft magnetic iron alloy thin film and magnetic head)

IT 7631-86-9, **Silicon oxide**, uses

RL: DEV (Device component use); USES (Uses)

(interlayer insulating layer; soft magnetic iron alloy thin film and magnetic head)

IT **162551-18-0P 162551-19-1P 162551-20-4P**

RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)

(soft magnetic iron alloy thin film and magnetic head)

IT 7429-90-5, Aluminum, uses 7439-98-7, Molybdenum, uses 7440-03-1, Niobium, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-22-4, Silver, uses 7440-25-7, Tantalum, uses 7440-32-6, Titanium, uses 7440-33-7, Tungsten, uses 7440-47-3, Chromium, uses 7440-57-5, Gold, uses 7440-62-2, Vanadium, uses 7440-67-7, Zirconium, uses 10043-11-5, **Boron nitride**, uses 12033-62-4,

**Tantalum nitride** 12033-89-5, **Silicon nitride**, uses 12648-34-9, Niobium nitride 24304-00-5,

**Aluminum nitride** 119173-61-4, Zirconium nitride

RL: DEV (Device component use); USES (Uses)

(underlayer; soft magnetic iron alloy thin film and magnetic head)

IT **162551-18-0P 162551-19-1P 162551-20-4P**

RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)

(soft magnetic iron alloy thin film and magnetic head)

L93 ANSWER 4 OF 11 HCAPLUS COPYRIGHT 2002 ACS

1995:347424 Document No. 122:229097 Cobalt-iron amorphous magnetic body with good abrasion and corrosion resistance. Nakajima, Mikio; Makino, Teruhiro (Alps Electric Co Ltd, Japan). Jpn. Kokai Tokkyo Koho JP 06322492 A2 19941122 Heisei, 5 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1993-296407 19931126.

AB The **laminated** magnetic body with thickness .gtoreq.40 .mu.m comprises (Fel-a,Coa)100-e-f-bCreRuf(**Sic**,Bd)b [a = 0.93-0.95; c / (c + d) = 0.55-0.65; b = 22-27 at.%; e = 0.4-2.6 at.%; f = 1.5-4.0 at.%]. The magnetic body showed high sat. magnetic flux d. and permeability.

IC ICM C22C045-04

ICS G11B005-127; H01F001-153

CC 77-8 (Magnetic Phenomena)

Section cross-reference(s): 55

IT **Magnetic substances**

(amorphous, cobalt-iron amorphous magnetic body with good abrasion and corrosion resistance)

IT Amorphous **substances**

(**magnetic**, cobalt-iron amorphous magnetic body with good

abrasion and corrosion resistance)

IT **115138-42-6P**, Boron 10, chromium 0.5, cobalt 68.5, iron 4.5, ruthenium 1.5, silicon 15 (atomic) **115138-43-7P**, Boron 9.2, chromium 0.4, cobalt 70, iron 4.6, ruthenium 2, silicon 13.8 (atomic) **115138-44-8P**, Boron 9.2, chromium 0.4, cobalt 69, iron 4.6, ruthenium 3, silicon 13.8 (atomic) **115138-45-9P**, Boron 9.2, chromium 0.4, cobalt 70.5, iron 4.6, ruthenium 1.5, silicon 13.8 (atomic) **115138-46-0P**, Boron 9.2, chromium 1, cobalt 69.4, iron 4.6, ruthenium 2, silicon 13.8 (atomic) **115138-47-1P**, Boron 9.2, chromium 1, cobalt 68.4, iron 4.6, ruthenium 3, silicon 13.8 (atomic) **115138-48-2P**, Boron 9.2, chromium 2.6, cobalt 67.8, iron 4.6, ruthenium 2, silicon 13.8 (atomic) **115138-49-3P**, Boron 9.2, chromium 2.6, cobalt 66.8, iron 4.6, ruthenium 3, silicon 13.8 (atomic) **161981-81-3P**, Boron 10, chromium 0.4, cobalt 68.6, iron 4.5, ruthenium 1.5, silicon 15 (atomic) **161981-82-4P**, Boron 10, chromium 1, cobalt 68.5, iron 4.5, ruthenium 1, silicon 15 (atomic) **161981-83-5P 161981-84-6P**

RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)

(cobalt-iron amorphous magnetic body with good abrasion and corrosion resistance)

IT **115138-42-6P**, Boron 10, chromium 0.5, cobalt 68.5, iron 4.5, ruthenium 1.5, silicon 15 (atomic) **115138-43-7P**, Boron 9.2, chromium 0.4, cobalt 70, iron 4.6, ruthenium 2, silicon 13.8 (atomic) **115138-44-8P**, Boron 9.2, chromium 0.4, cobalt 69, iron 4.6, ruthenium 3, silicon 13.8 (atomic) **115138-45-9P**, Boron 9.2, chromium 0.4, cobalt 70.5, iron 4.6, ruthenium 1.5, silicon 13.8 (atomic) **115138-46-0P**, Boron 9.2, chromium 1, cobalt 69.4, iron 4.6, ruthenium 2, silicon 13.8 (atomic) **115138-47-1P**, Boron 9.2, chromium 1, cobalt 68.4, iron 4.6, ruthenium 3, silicon 13.8 (atomic) **115138-48-2P**, Boron 9.2, chromium 2.6, cobalt 67.8, iron 4.6, ruthenium 2, silicon 13.8 (atomic) **115138-49-3P**, Boron 9.2, chromium 2.6, cobalt 66.8, iron 4.6, ruthenium 3, silicon 13.8 (atomic) **161981-81-3P**, Boron 10, chromium 0.4, cobalt 68.6, iron 4.5, ruthenium 1.5, silicon 15 (atomic) **161981-82-4P**, Boron 10, chromium 1, cobalt 68.5, iron 4.5, ruthenium 1, silicon 15 (atomic) **161981-83-5P 161981-84-6P**

RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)

(cobalt-iron amorphous magnetic body with good abrasion and corrosion resistance)

L93 ANSWER 5 OF 11 HCAPLUS COPYRIGHT 2002 ACS

1990:583465 Document No. 113:183465 Heat-resistant magnetic iron alloy film and magnetic head using it. Kobayashi, Toshio; Nakatani, Ryoichi; Kumasaka, Takayuki (Hitachi, Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 02123705 A2 19900511 Heisei, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1988-276250 19881102.

AB The Fe ferromagnetic film contains Group IVB, VB, and VIB metals of Ti, Zr, Hf, V, Nb, Ta, Mo, and/or W 0.1-10, B, C, and/or N 0.1-1, and optional Rh and/or Ru 0.1-10 at.%. The ferromagnetic film may be laminated with a nonmagnetic intermediate insulating layer and an optional metal layer. The magnetic head uses the film as a magnetic pole material. The film showed excellent satn. magnetic flux d., permeability, heat resistance, and corrosion resistance.

IC ICM H01F010-14

ICS C22C038-00; G11B005-147

CC 77-8 (Magnetic Phenomena)

Section cross-reference(s): 55

ST iron film magnetic **recording** head; heat resistance magnetic head film

IT **Recording** apparatus  
(magnetic heads)

IT 1344-28-1, Alumina, uses and miscellaneous 7440-44-0, Carbon, uses and miscellaneous 7631-86-9, Silica, uses and miscellaneous 10043-11-5, **Boron nitride (BN)**, uses and miscellaneous 12033-89-5, **Silicon nitride (Si3N4)**, uses and miscellaneous

RL: USES (Uses)  
(insulating layer, magnetic **recording** head using)

IT 129963-80-0 129963-81-1 129963-82-2  
129963-83-3 129963-84-4 129963-85-5  
129963-86-6 129963-87-7 129963-88-8  
129963-89-9 129963-90-2 129963-91-3  
129963-92-4 129963-93-5 129963-94-6 129963-95-7  
129963-96-8 129963-97-9 129963-98-0  
129963-99-1 129964-00-7 129964-01-8 129964-02-9

RL: PRP (Properties)  
(magnetic film, heat-resistant, for **recording** heads)

IT 7429-90-5, Aluminum, uses and miscellaneous 7440-02-0, Nickel, uses and miscellaneous 7440-50-8, Copper, uses and miscellaneous

RL: USES (Uses)  
(magnetic **recording** head using)

IT 11110-43-3

RL: PRP (Properties)  
(magnetic **recording** head using)

IT 129963-80-0 129963-82-2 129963-83-3  
129963-84-4 129963-85-5 129963-86-6  
129963-87-7 129963-88-8 129963-89-9  
129963-90-2 129963-92-4 129963-94-6  
129963-96-8 129963-97-9 129963-99-1

RL: PRP (Properties)  
(magnetic film, heat-resistant, for **recording** heads)

L93. ANSWER 6 OF 11 HCAPLUS COPYRIGHT 2002 ACS

1989:599511 Document No. 111:199511 Iron alloy for **laminated** magnetic heads. Yoshizawa, Katsuto; Yamauchi, Kiyotaka (Hitachi Metals, Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 01028343 A2 19890130 Heisei, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1987-183877 19870723.

AB The Fe alloy is alternately **laminated** with a nonmagnetic substance (esp. **SiO2** film) to manuf. improved magnetic heads. The Fe alloy is Fe100-x-y-zMyBxAz having: M = Ti, Zr, Hf, V, Nb, Ta, Cr, W, Mn, Ru, Bh, Pd, Os, Ir, and/or Pt; x = 2-10, y .ltoreq.10, and z .ltoreq.10 at.%; and A = C, Si, Ge, Ga, Al, In, and/or Sn. The alloy shows av. grain size of .ltoreq.500 .ANG. in the bcc. structure. Sputtered alloy films typically show satd. magnetic flux d. 18.0-20.8 kG, magnetostriction (x 10<sup>-6</sup>) -3.7 to + 3.0, magnetic permeability 1190-1270 at 10 MHz, and good corrosion resistance.

IC ICM C22C038-00  
ICS C22C038-38; G11B005-127; H01F010-14

CC 55-3 (Ferrous Metals and Alloys)  
Section cross-reference(s): 77

ST iron alloy sputtering magnetic head; silica **lamine** iron alloy

IT Sputtering  
(of iron alloys, **laminated** composites for magnetic heads by)

IT **Recording** apparatus  
(magnetic heads, composites for, **laminated** structure of sputtered)

IT 123461-45-0 123461-46-1 123461-47-2 123461-48-3  
123461-49-4 123461-50-7 123461-51-8 123461-52-9  
123461-53-0 123461-54-1 123461-55-2 123461-56-3  
123461-57-4 123461-58-5 123461-59-6 123461-60-9 123461-61-0  
123461-62-1 123461-63-2 123461-64-3 123461-65-4  
123461-66-5 123461-67-6 123461-68-7 123461-69-8  
123461-70-1 123480-02-4

RL: USES (Uses)

(for magnetic heads, sputtering with **lamination** of)

IT 123461-45-0 123461-46-1 123461-49-4  
123461-50-7 123461-54-1 123461-61-0  
123461-62-1 123461-63-2 123461-66-5  
123461-70-1

RL: USES (Uses)

(for magnetic heads, sputtering with **lamination** of)

L93 ANSWER 7 OF 11 HCAPLUS COPYRIGHT 2002 ACS

1988:603595 Document No. 109:203595 Soft magnetic thin film for  
**magnetic head core**. Hayashi, Kazuhiko; Hayakawa,  
Masatoshi; Katori, Kenji; Aso, Koichi (Sony Corp., Japan). Jpn. Kokai  
Tokkyo Koho JP 63099507 A2 19880430 Showa, 6 pp. (Japanese). CODEN:  
JKXXAF. APPLICATION: JP 1986-244928 19861015.

AB The film consists of a **laminated** of a Fe-Ga-Si-type thin film and  
an oxide magnetic thin film. Fe<sub>74</sub>Ru<sub>4</sub>Ga<sub>8</sub>Si<sub>14</sub> and Mn-Zn ferrite were used  
as the targets for sputtering on a CaTiO<sub>3</sub> substrate to give a thin film,  
which was 50 times **laminated** to give title film showing high  
permeability in a high-frequency region and having excellent soft magnetic  
properties.

IC ICM H01F010-08

CC 77-8 (Magnetic Phenomena)

Section cross-reference(s): 55

IT Sputtering

(in iron-gallium-silicon alloy film-oxide film  
magnetic **laminated** prepn.)

IT **Recording materials**

(**magnetic**, iron-gallium-silicon alloy thin film-oxide film  
**laminates**, for heads)

IT **Recording apparatus**

(magnetic heads, manuf. of)

IT 12645-49-7, Manganese zinc ferrite

RL: PRP (Properties)

(magnetic thin films from, **laminated** with  
iron-gallium-silicon alloy thin films)

IT 117351-64-1

RL: PRP (Properties)

(magnetic thin films from, **laminated** with oxide thin films)

IT 117351-64-1

RL: PRP (Properties)

(magnetic thin films from, **laminated** with oxide thin films)

L93 ANSWER 8 OF 11 HCAPLUS COPYRIGHT 2002 ACS

1988:42482 Document No. 108:42482 **Ruthenium alloy**  
coating on mirror. Aisaka, Tatsuyoshi; Matsumoto, Tatsuhiko (Toshiba  
Corp., Japan). Jpn. Kokai Tokkyo Koho JP 62180301 A2 19870807 Showa, 6  
pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1986-21176 19860204.

AB The mirror for reflection of a strong beam, e. g. a laser, is made of  
ceramic fiber-reinforced Cu or Cu alloy, and is optionally coated with  
W-(5-45%) Ru or Mo-(5-75%) **Ru alloy**. Thus, a sintered  
Mo **disk** (1.2 mm) contg. C 5 and O 65 ppm was **laminated**  
with a hot-pressed **disk** (14 mm) of composite alloy contg. Cu 45,



Zr 10, and C fibers 45 vol% and having a linear thermal expansion coeff. at room temp. -300.degree. of 4.5 .times. 10-6/.degree.. The **laminates** with an amorphous Ni braze insert was heated 3 h in vacuum at 750.degree. and 0.5 kg/cm2 load, and then polished with aq. **SiO2** to have a surface roughness (root-mean-square) of <10 nm. The mirror product was used to reflect a laser beam (wavelength 10.6 .mu.); the reflectivity was 98.1 or 94.3%, before or after weathering in humid (90%) before or after weathering in humid (90%) air at 90.degree. for 500 h.

- IC ICM G02B005-08  
ICS B22F007-06; B32B015-01; C22C001-09; C22C027-04; C23C014-16;  
C23C016-06; C23C028-02
- CC 56-4 (Nonferrous Metals and Alloys)  
Section cross-reference(s): 57
- ST laser mirror composite alloy **lamination**; carbon fiber reinforced copper alloy; molybdenum **ruthenium alloy** laser mirror;  
tungsten **ruthenium alloy** laser mirror
- IT **Lamination**  
(of sintered molybdenum or tungsten, with carbon fiber-reinforced copper alloy, for laser mirror)
- IT Mirrors  
(laser, ceramic fiber-reinforced copper or copper alloy **laminates** for, coating with **ruthenium alloy** of)
- IT Lasers  
(mirrors, ceramic fiber-reinforced copper or copper alloy **laminates** for, coating with **ruthenium alloy** of)
- IT **112293-12-6**  
RL: USES (Uses)  
(sintered, **lamination** with ceramic fiber-reinforced copper alloy, for laser mirror)
- IT 7439-98-7, Molybdenum, properties 7440-33-7, Tungsten, properties  
RL: PRP (Properties)  
(sintered, **lamination** with ceramic fiber-reinforced copper alloy, for laser mirror)
- IT **99150-16-0**  
RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(sputter coating with, in manuf. of laser mirrors)
- IT **112293-12-6**  
RL: USES (Uses)  
(sintered, **lamination** with ceramic fiber-reinforced copper alloy, for laser mirror)
- IT **99150-16-0**  
RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(sputter coating with, in manuf. of laser mirrors)
- L93 ANSWER 9 OF 11 HCAPLUS COPYRIGHT 2002 ACS  
1985:480780 Document No. 103:80780 Ferromagnetic material for a magnetic head. Shiiki, Kazuo; Kumasaka, Noriyuki; Shiroishi, Yoshihiro; Nakamura, Hitoshi; Hamakawa, Yoshihiro; Saito, Noritoshi; Aoki, Shigeo; Shinagawa, Kiminari; Kuro, Mitsuhiro (Hitachi, Ltd., Japan). Eur. Pat. Appl. EP 144150 A1 19850612, 41 pp. DESIGNATED STATES: R: DE, FR, GB, NL. (English). CODEN: EPXXDW. APPLICATION: EP 1984-307448 19841029. PRIORITY: JP 1983-204834 19831102; JP 1984-10077 19840125.
- AB A ferromagnetic material is described consisting of Si 2-12 wt.% and 5-25 wt.% of at least one element of the group Ru, Rh, Pd, Ir, Pt, Au, and Ag; it exhibits a satn. flux d. and good corrosion resistance. Excellent magnetic characteristics are obtained in a **multilayered** film obtained by alternately **laminating** the above ferromagnetic

material and a spacer layer composed of other material. A markedly increased **recording** d. is exhibited by a magnetic head for perpendicular **recording**, when the end of the main pole is composed of the ferromagnetic material. For example, a **multilayered** film of total thickness .apprx.2.mu. and which was obtained by alternately **laminating** a film of Fe-Si 6.5-Ru 10 wt.% alloy 0.1 .mu. thick and a SiO<sub>2</sub> film 50 .ANG.thick exhibited a permeability comparable to that of Permalloy films, a flux d. of 16 kG (vs. 10 kG for Permalloy), and excellent corrosion resistance. A single layer of the Fe-Si 6.5-Ru 10 wt.% alloy exhibited a permeability of 300-500. A **recording** head made from the **lamine** exhibited excellent characteristics.

IC ICM H01F001-14  
ICS C22C038-02; G11B005-127  
CC 77-8 (Magnetic Phenomena)  
ST ferromagnetic iron ruthenium silicon; **recording** head iron ruthenium silicon  
IT **Recording** materials  
(iron-ruthenium-silicon ferromagnetic alloy, for **laminated** heads)  
IT **Recording** apparatus  
(magnetic, heads, with iron-ruthenium-silicon alloy **laminates**)  
IT 97696-47-4  
RL: PRP (Properties)  
(ferromagnetic, for **recording** head **laminates**)  
IT 7631-86-9, uses and miscellaneous  
RL: USES (Uses)  
(spacer of, for iron-ruthenium-silicon ferromagnetic alloy **laminated recording** heads)  
IT 97696-47-4  
RL: PRP (Properties)  
(ferromagnetic, for **recording** head **laminates**)

L93 ANSWER 10 OF 11 HCAPLUS COPYRIGHT 2002 ACS

1985:425715 Document No. 103:25715 Abrasion-resistant high magnetic permeability amorphous iron-silicon-cobalt-ruthenium alloys. (Hitachi Metals, Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 60033341 A2 19850220 Showa, 3 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1983-141486 19830802.

AB The alloys contain Si 16.5-20, Co 11-16, and Ru 0.05-3, optionally .gtoreq.1 of Ti, V, Nb, Ta, Cr, Mo, W, and Cu <2 at. %. The 40-70 .times. 5-9 mm .times. several m ribbon by the double roll process was sandwiched between Al<sub>2</sub>O<sub>3</sub> sheets, heated at 1150.degree. in vacuum for 2 h, photoetched, and **laminated** to a magnetic head. The wear after **tape** sliding for 100 h was 0.3-1.9 (decreasing with increasing Ru) with little deterioration in magnetic properties, compared to 2 with Fe<sub>69</sub>Co<sub>13</sub>Si<sub>18</sub>. Thus, an amorphous Fe<sub>0.69</sub>Co<sub>0.13</sub>Si<sub>0.18</sub>)<sub>99.5</sub>Ru<sub>0.5</sub> [97106-05-3] had satn. induction 14.6 kG, coercivity 47 m.OMEGA., initial and max. permeability 19,000 and 121,000, resp., elec. resistivity 110 m.OMEGA.-cm, Vickers hardness 600, and abrasion wear 0.8 .mu. vs. 14.8, 48, 20,000, 122,000, 110, 600, and 0.2 without Ru or 11, 25, 30,000, 117,500, 80, 500, and not available for Sendust.

IC ICM C22C038-34  
ICA H01F001-14  
CC 55-3 (Ferrous Metals and Alloys)  
Section cross-reference(s): 77  
ST iron silicon cobalt ruthenium glass; **magnetic tape**  
iron ruthenium glass

- IT Glass, nonoxide  
RL: USES (Uses)  
(iron alloys, for **magnetic tapes**)
- IT **Recording materials**  
(iron-silicon-cobalt-ruthenium amorphous alloys,  
for **magnetic tapes**)
- IT 97105-96-9 97105-97-0 97105-98-1  
97105-99-2 97106-00-8 97106-01-9  
97106-02-0 97106-03-1 97106-04-2  
97106-05-3  
RL: USES (Uses)  
(abrasion resistance of amorphous, for **magnetic tapes**  
)
- IT 7440-18-8, uses and miscellaneous  
RL: USES (Uses)  
(alloying with, of abrasion-resistant iron-silicon-cobalt amorphous  
alloys for **magnetic tape**)
- IT 97105-96-9 97105-97-0 97105-98-1  
97105-99-2 97106-00-8 97106-01-9  
97106-02-0 97106-03-1 97106-04-2  
97106-05-3  
RL: USES (Uses)  
(abrasion resistance of amorphous, for **magnetic tapes**  
)
- L93 ANSWER 11 OF 11 HCAPLUS COPYRIGHT 2002 ACS
- 1983:220412 Document No. 98:220412 **Magnetic head cores.**  
(TDK Electronics Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 57198521 A2  
19821206 Showa, 10 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP  
1981-81681 19810528.
- AB **Magnetic head cores** are made of **laminated**  
ribbons (.gtoreq.40 .mu. thick) of (FepCoqNir)xRuyCrzMw(SikBlXm)v where M  
is .gtoreq.1 of Fe-group and transition elements except Ru and Cr, X is  
.gtoreq.1 of glassifying agents except Si and B, y, z, w, and v are  
0.01-8, 0.5-8, 0-4, and 20-26 at.%, x + y + z + w + v = 100 at.%, p + q +  
r = 100 wt.%, k + l + m = 100 wt.%, p, r, k, m = 3-7, 0-10, 0.5-20, and  
0-2 wt.%. Thus, glassy alloy ribbons (50 .mu. thick) of  
(Fe5.5Co94.5)68.5Ru6Cr4(Si10B90)21.5 [**85960-03-8**] were  
heat-treated at or above the Curie point to yield 7.8 kG satd. magnetic  
flux d. and 3 .mu. surface roughness, made to a core with gaping faces  
vacuum-coated with **SiO2**, and used to contact with a Co-doped  
.gamma.-Fe2O3 powder type audio **magnetic tape** at 5.5  
m/s line speed and 50% relative humidity for 100 h. The surface wear of  
the head was 0.3 .mu..
- IC G11B005-16; C22C019-07; G11B005-12; H01F001-16
- CC 56-3 (Nonferrous Metals and Alloys)  
Section cross-reference(s): 77
- ST glassy alloy **magnetic head core**; silica magnetic head  
coating
- IT Glass, nonoxide  
RL: PRP (Properties)  
(metal, ribbons, for **magnetic head core**)
- IT **Recording apparatus**  
(magnetic, heads, glassy alloy cores, heat-treated and silica coated,  
for audio **tape recorders**)
- IT Coating process  
(vacuum, of glassy-alloy **magnetic head core**, with  
silica)
- IT 7631-86-9, uses and miscellaneous  
RL: USES (Uses)

(coating of, on magnetic head core)  
IT 85960-03-8 85960-04-9  
RL: USES (Uses)  
(glassy, for magnetic head core)  
IT 85960-03-8 85960-04-9  
RL: USES (Uses)  
(glassy, for magnetic head core)

=> d his

Nik,

I am also including some results from INSPEC and Metadex files.

FILE 'INSPEC' ENTERED AT 10:41:51 ON 13 SEP 2002

L94 2153 S (RU OR RUTHENIUM) (2N)ALLOY?  
L95 51 S L94 AND L42  
L96 2 S L95 AND L40  
L97 9 S L95 AND L30  
L98 1 S L95 AND (L37 OR L38)  
L99 11 S L96 OR L97 OR L98

FILE 'METADEX' ENTERED AT 10:53:13 ON 13 SEP 2002

L100 702 S (RU OR RUTHENIUM) (2N)ALLOY?  
L101 24 S L100 AND L42  
L102 9 S L101 AND (L15 OR L16)

=> t L99 1 ti ab cc ct so

L99 ANSWER 1 OF 11 INSPEC COPYRIGHT 2002 IEE  
TI Development of CoX/Pd **multilayer** perpendicular magnetic  
**recording** media with granular seed layers.  
AB CoCrRu-based granular seed layers are studied to control the hysteresis  
properties of CoX/Pd **multilayer** based perpendicular magnetic  
**recording** media. Proper choice of the CoCrRu growth conditions is  
found to reduce the hysteresis slope parameter alpha and to improve the  
switching field distribution, suggesting that this granular seed layer is  
effective in producing exchange decoupled columnar structures. The results  
are confirmed by magnetic force microscopy studies of **recorded**  
patterns as well as by DC/AC-erase noise measurements, remanent coercivity  
studies and microstructural observations by transmission electron  
microscopy.  
CC A7570C Interfacial magnetic properties; A7550S Magnetic recording  
materials; A7550R Magnetism in interface structures; A7560E Magnetization  
curves, hysteresis, Barkhausen and related effects; A7530E Exchange and  
superexchange interactions in magnetically ordered materials; A7550C  
Ferromagnetism of nonferrous metals and alloys  
CT CHROMIUM ALLOYS; COBALT ALLOYS; EXCHANGE INTERACTIONS (ELECTRON);  
FERROMAGNETIC MATERIALS; MAGNETIC HYSTERESIS; MAGNETIC **MULTILAYERS**  
; MAGNETIC SWITCHING; PALLADIUM; PERPENDICULAR MAGNETIC **RECORDING**  
; **RUTHENIUM ALLOYS**  
SO Journal of Magnetism and Magnetic Materials (April 2002) vol.242-245,  
p.297-303. 18 refs.  
Doc. No.: S0304-8853(01)01235-5  
Published by: Elsevier  
Price: CCCC 0304-8853/02/\$22.00  
CODEN: JMMMD C ISSN: 0304-8853  
SICI: 0304-8853(200204)242/245L:297:DMPM;1-U  
Conference: Joint European Magnetic Symposium JEMS'01. Grenoble, France,  
28 Aug-1 Sept 2001

=> t L99 2-11 ti ab cc ct so

- L99 ANSWER 2 OF 11 INSPEC COPYRIGHT 2002 IEE  
TI Lattice matching effect of Co-(Cr,Ru) **alloy** underlayer  
on magnetic properties of Co-Cr-Pt longitudinal **recording** media.  
AB Magnetic properties are investigated for Co-Cr-Pt thin films deposited on  
**nonmagnetic** h.c.p.-Co(Cr,Ru) underlayers with different h.c.p.  
lattice constants. Higher coercivity, higher coercive squareness, and  
lower fluctuation field are observed when the h.c.p. lattice constant is  
close to that of the Co-Cr-Pt **recording** layer. Temperature  
dependence of magnetic properties indicates that employment of  
**nonmagnetic** Co-Cr-Ru layer is effective to increase the coercivity  
and to enhance the thermal stability of **recording** layer.  
CC A7570A Magnetic properties of monolayers and overlayers; A7550S Magnetic  
recording materials; A6155H Crystal structure of specific alloys; A7560E  
Magnetization curves, hysteresis, Barkhausen and related effects; A7550V  
High coercivity magnetic materials; B3120B Magnetic recording  
CT CHROMIUM ALLOYS; COBALT ALLOYS; COERCIVE FORCE; LATTICE CONSTANTS;  
MAGNETIC **RECORDING**; MAGNETIC THIN FILMS; PLATINUM ALLOYS;  
**RUTHENIUM ALLOYS**; THERMAL STABILITY  
SO IEEE Transactions on Magnetics (Sept. 2000) vol.36, no.5, pt.1, p.2303-5.  
5 refs.  
Doc. No.: S0018-9464(00)08478-8  
Published by: IEEE  
Price: CCCC 0 7803 5943 7/2000/\$10.00  
CODEN: IEMGAQ ISSN: 0018-9464  
SICI: 0018-9464(200009)36:5:1L.2303:LMEA;1-W  
Conference: INTERMAG 2000 Digest of Technical Papers. 2000 IEEE  
International Magnetics Conference. Toronto, Ont., Canada, 9-13 April 2000
- L99 ANSWER 3 OF 11 INSPEC COPYRIGHT 2002 IEE  
TI Canting of exchange coupling direction in spin valve with various pinned  
layers.  
AB One of the problems in spin valve (SV) is the thermal stability of  
exchange coupling between the pinned magnetic layer and the  
antiferromagnetic (AFM) layer. During operating in actual hard  
**disk** drives, the pinned direction tends to cant toward the  
longitudinal hard magnet direction and as a result, the output voltage  
drops. In this study we examine the amount of the cant by the heat and  
field in SV which used different pinned layer material. The sample we used  
is Ta(5)/NiFe(9)/Co(1)/Cu(2.7)/pinned layer/AFM/Ta(5) unit nanometers. The  
pinned layer is three kinds-Co(2), Co(1)/NiFe(1.7), NiFe(3.5), and AFM is  
two kinds of Ru3Rh15Mn(12 nm), Ru3Rh15Mn(8 nm). The pinned-Co-SV has a  
larger increase of canting degree than the pinned-Co/NiFe-SV and the  
pinned-NiFe-SV. The longer the SV is exposed to heat and magnetic field,  
the more the cant increases. It is likely due to the change of the local  
pinned direction which in turn may be due to the aftereffect in the minute  
AFM grains during the heating process.  
CC A7570C Interfacial magnetic properties; A7530E Exchange and superexchange  
interactions in magnetically ordered materials; A7550R Magnetism in  
interface structures; A7525 Spin arrangements in magnetically ordered  
materials; A7550S Magnetic recording materials; A7550E Antiferromagnetics;  
B3110M Magnetic multilayers; B3120B Magnetic recording  
CT ANTIFERROMAGNETIC MATERIALS; CANTED SPIN ARRANGEMENTS; COBALT; COPPER;  
DISC DRIVES; EXCHANGE INTERACTIONS (ELECTRON); HARD DISCS; IRON ALLOYS;  
MAGNETIC **MULTILAYERS**; MANGANESE ALLOYS; NICKEL ALLOYS; RHODIUM  
ALLOYS; **RUTHENIUM ALLOYS**; SPIN VALVES; TANTALUM;  
THERMAL STABILITY  
SO Journal of Applied Physics (15 April 1999) vol.85, no.8, p.4973-5. 11  
refs.  
Doc. No.: S0021-8979(99)30408-4

Published by: AIP

Price: CCCC 0021-8979/99/85(8)/4973(3)/\$15.00

CODEN: JAPIAU ISSN: 0021-8979

SICI: 0021-8979(19990415)85:8L:4973:CECD;1-0

Conference: 43rd Annual Conference on Magnetism and Magnetic Materials.  
Miami, FL, USA, 9-12 Nov 1998

- L99 ANSWER 4 OF 11 INSPEC COPYRIGHT 2002 IEE
- TI New antiferromagnetic RuRhMn film and its application for spin-valves.
- AB We have successfully developed new RuRhMn antiferromagnetic (AF) films for spin-valves. The spin-valves with RuRhMn exhibit larger unidirectional anisotropy (H<sub>ua</sub>), higher blocking temperature (T<sub>b</sub>), higher thermal stability and higher corrosion resistance than those with FeMn films. The MR ratio of 7.4% and T<sub>b</sub> of 250 degrees C are obtained for glass/Ta(5)-NiFe(7)-Co(0.5)-Cu(3)-Co(2.5)-RuRhMn(10)-Ta(5), unit nm, spin-valve with H<sub>ua</sub> of 350 Oe. The rest potential of RuRhMn films is listed between one of NiFe and Co films and is much better than that of FeMn films.
- CC A7570F Magnetic ordering in multilayers; A7550E Antiferromagnetics; A7530G Magnetic anisotropy; B3120B Magnetic recording; B3110M Magnetic multilayers
- CT ANTIFERROMAGNETIC MATERIALS; GIANT MAGNETORESISTANCE; HARD DISCS; MAGNETIC ANISOTROPY; MAGNETIC HEADS; MAGNETIC **MULTILAYERS**; MAGNETIC THIN FILMS; MANGANESE ALLOYS; RHODIUM ALLOYS; **RUTHENIUM ALLOYS**; THERMAL STABILITY
- SO IEEE Transactions on Magnetics (March 1998) vol.34, no.2, pt.1, p.387-9. 13 refs.
- Published by: IEEE
- Price: CCCC 0018-9464/98/\$10.00
- CODEN: IEMGAQ ISSN: 0018-9464
- SICI: 0018-9464(199803)34:2:1L:387:ARFA;1-B
- Conference: Asia-Pacific Data Storage Conference. Taoyuan, Taiwan, 16-18 July 1997
- L99 ANSWER 5 OF 11 INSPEC COPYRIGHT 2002 FIZ KARLSRUHE
- TI Magnetic and magneto-optical properties of CoPtM (M=Re, Ru) **alloy** films for a new **magneto-optical recording material**.
- AB CoPtM (M=Re, Ru) ternary **alloy** films have been investigated as new magneto-optical materials for blue laser **recording**. The CoPtRe and CoPtRu alloy films were prepared by sputtering without a heating process, and exhibited good perpendicular magnetic anisotropy and magnetic hysteresis loop squareness. For the magneto-optical properties, the figure of merit for the CoPtRe alloy film with less than 15 at% Re at lambda <530 nm is shown to be superior to that for TbFeCo amorphous film and inferior 0-4 dB to that of Co/Pt **multilayers**.
- CC A7570A Magnetic properties of monolayers and overlayers; A7865E Optical properties of metallic thin films; A7820L Magneto-optical effects (condensed matter); A7560E Magnetization curves, hysteresis, Barkhausen and related effects; A7530G Magnetic anisotropy; A6855 Thin film growth, structure, and epitaxy; B3120B Magnetic recording; B3120N Magnetic thin film devices; B4120 Optical storage and retrieval; B3110C Ferromagnetic materials; B4160 Magneto-optical devices
- CT COBALT ALLOYS; KERR MAGNETO-OPTICAL EFFECT; MAGNETIC ANISOTROPY; MAGNETIC HYSTERESIS; MAGNETIC THIN FILMS; MAGNETO-OPTICAL **RECORDING**; PLATINUM ALLOYS; RHENIUM ALLOYS; **RUTHENIUM ALLOYS**; SPUTTERED COATINGS
- SO Journal of Magnetism and Magnetic Materials (Jan. 1996) vol.152, no.1-2, p.243-52. 13 refs.

Published by: Elsevier  
Price: CCCC 0304-8853/96/\$15.00  
CODEN: JMMDC ISSN: 0304-8853  
SICI: 0304-8853(199601)152:1/2L.243:MMOP;1-3

- L99 ANSWER 6 OF 11 INSPEC COPYRIGHT 2002 IEE  
TI Structure and magnetic properties of FeRuGaSi **multilayer** thin films.  
AB The structure and magnetic properties of FeRuGaSi thin films used in very-high-frequency (150 MHz) **recording** head has been studied. The best soft magnetic properties, viz., coercivity of 0.2-0.3 Oe, permeability of 2000 at 1 MHz and 400-500 at 150 MHz, and magnetostriction of less than  $10^{-6}$ , were obtained after annealing at 450-500 degrees C. This magnetic behavior was attributed to the phase transformations and the increase in the grain size of the films occurring during the annealing process. Transmission electron diffraction revealed that B2 and/or DO3 ordered phases were formed in the films depending on the annealing temperature. However, good soft magnetic properties were associated with the formation of the B2 phase with low crystal anisotropy and saturation magnetostriction. These results are somewhat in contrast to what has been observed in Sendust, where magnetic softness is usually attributed to the formation of the DO3 phase.  
CC A7570F Magnetic ordering in multilayers; A7570C Interfacial magnetic properties; A7550B Ferromagnetism of Fe and its alloys; A7530G Anisotropy; A7530K Magnetic phase boundaries; A7560E Magnetization curves, hysteresis, Barkhausen and related effects; A7550R Magnetism in interface structures; A6855 Thin film growth, structure, and epitaxy; A7580 Magnetomechanical and magnetoelectric effects, magnetostriction  
CT COERCIVE FORCE; FERROMAGNETIC PROPERTIES OF SUBSTANCES; GALLIUM ALLOYS; GRAIN SIZE; IRON ALLOYS; MAGNETIC ANISOTROPY; MAGNETIC HEADS; MAGNETIC PERMEABILITY; MAGNETIC **RECORDING**; MAGNETIC THIN FILMS; MAGNETIC TRANSITIONS; MAGNETOSTRICTION; **RUTHENIUM ALLOYS**;  
SO SILICON ALLOYS; TRANSMISSION ELECTRON MICROSCOPE EXAMINATION OF MATERIALS  
Journal of Applied Physics (15 April 1991) vol.69, no.8, pt.2B, p.5628-30. 11 refs.  
Price: CCCC 0021-8979/91/085628-03\$03.00  
CODEN: JAPIAU ISSN: 0021-8979  
Conference: Thirty-Fifth IEEE Conference on Magnetism and Magnetic Materials. San Diego, CA, USA, 29 Oct-1 Nov 1990  
Sponsor(s): AIP; IEEE; et al
- L99 ANSWER 7 OF 11 INSPEC COPYRIGHT 2002 IEE  
TI A magnetic head for 150 MHz, high density **recording**.  
AB A **multilayered** magnetic head that can read and write at 150 MHz on metal particle **tape** with a coercivity of 120 kA/m (1500 Oe) has been developed. Ten 2-  $\mu$  m layers of Fe<sub>68</sub>Ru<sub>8</sub>Ga<sub>7</sub>Si<sub>17</sub> alloy, with 100 nm of SiO<sub>2</sub> used as spacer, form the **magnetic-core** thickness and the track width. The head was tested in a rotary **recording** system at a relative head-to-**tape** speed of 73 m/s. At a linear density of 4000 fc/mm (100 kfc) and 150 MHz, the measured single frequency signal to 300-kHz-slot noise was 33 dB (RMS-RMS). The measured frequency response curve agrees with theory and indicates a head-to-**tape** spacing of 70 nm at high speed. The read efficiency of the head decreases from 37% at low frequency to 15% at 150 MHz.  
CC B3120B Magnetic tapes, discs and recording heads  
CT GALLIUM ALLOYS; IRON ALLOYS; **MAGNETIC CORES**; MAGNETIC HEADS; MAGNETIC **RECORDING**; RANDOM NOISE; **RUTHENIUM ALLOYS**; SILICON ALLOYS  
SO IEEE Transactions on Magnetism (Nov. 1990) vol.26, no.6, p.2960-5. 21



refs.

Price: CCCC 0018-9464/90/1100-2960\$01.00

CODEN: IEMGAQ ISSN: 0018-9464

Conference: Magnetic Recording Conference. San Diego, CA, USA, 23-26 July 1990

Sponsor(s): IEEE

L99 ANSWER 8 OF 11 INSPEC COPYRIGHT 2002 IEE

TI MIG head identifying that metal film runs parallel to the gap forming layer.

AB A description is given of a metal-in-gap (MIG) head for use in high-density **recording** that is composed of a Mn-Zn ferrite core and sputtered FeGaSiRuO metal film, and in which the metal film is shown to run parallel to the gap-forming layer. In this type of head the boundary between the metal and the ferrite usually acts as a pseudo-gap, resulting in a ripple in the playback output spectrum. It was found experimentally that some metal elements and oxygen, contained in both the magnetic metal alloy and the ferrite, diffuse around the boundary during the heating process. Due to the diffusion of these elements, **nonmagnetic** and weakly magnetic layers grow at the boundary and form a pseudo-gap. The formation of these undesired layers was suppressed by using FeGaSiRuO alloy with a high magnetic flux density, thus reducing the ripple in the playback output spectrum.

CC B3120B Magnetic tapes, discs and recording heads; B0530 Metals and alloys; B3110E Ferrites and garnets

CT FERRITE DEVICES; GALLIUM ALLOYS; IRON ALLOYS; MAGNETIC HEADS; MAGNETIC **RECORDING**; MANGANESE ALLOYS; METALLIC THIN FILMS; **RUTHENIUM ALLOYS**; SILICON ALLOYS; ZINC ALLOYS

SO IEEE Translation Journal on Magnetism in Japan (Feb. 1989) vol.4, no.2, p.85-9. 4 refs.

Price: CCCC 0882-4959/89/0200-0085\$12.00

CODEN: ITJER ISSN: 0882-4959

L99 ANSWER 9 OF 11 INSPEC COPYRIGHT 2002 IEE

TI Soft magnetic properties of FeRuGaSi alloy films: SOFMAX.

AB To advance new soft magnetic materials of an FeGaSi alloy into the commercial world, improvements on various properties were designed by introducing additive elements without sacrificing its high saturation magnetic induction. The detailed studies on the diversified properties, such as saturation magnetic induction, film internal stress, wear resistivity, and so on, were performed. High-frequency permeability of the **laminated** structure film was also investigated. As a result, the **Ru-added FeRuGaSi alloy** films, whose typical compositions are Fe<sub>72</sub>Ru<sub>4</sub>Ga<sub>7</sub>Si<sub>17</sub> and Fe<sub>68</sub>Ru<sub>8</sub>Ga<sub>7</sub>Si<sub>17</sub> (at.%), prove to be excellent soft magnetic materials especially appropriate for the magnetic **recording**/playback head core use.

CC A6220P Tribology; A6855 Thin film growth, structure, and epitaxy; A7560E Magnetization curves, hysteresis, Barkhausen and related effects; A7570A Magnetic properties of monolayers and overlayers; A8140P Friction, lubrication, and wear

CT ALLOYING ADDITIONS; GALLIUM ALLOYS; INTERNAL STRESSES; IRON ALLOYS; MAGNETIC HEADS; MAGNETIC PERMEABILITY; MAGNETIC THIN FILMS; **RUTHENIUM ALLOYS**; SILICON ALLOYS; WEAR

SO Journal of Applied Physics (15 July 1988) vol.64, no.2, p.772-9. 20 refs.

Price: CCCC 0021-8979/88/140772-08\$02.40

CODEN: JAPIAU ISSN: 0021-8979

L99 ANSWER 10 OF 11 INSPEC COPYRIGHT 2002 IEE

TI Perpendicular **recording** characteristics of eight-turn probe type thin film head.

- AB The perpendicular magnetic **recording**/reproduction characteristics of a perpendicular **recording** thin-film head were compared with those of ring heads, in tests using Co-Cr/Co-Zr-Mo double-layer thin film media. The main pole of the thin film head was a 0.3  $\mu\text{m}$  Fe-Si-Ru/Ni-Fe **multilayered** film. The reproduced output per unit coil turn and the overwrite characteristics were both better for the thin film head, and noise levels were lower. The differences are attributed to the larger magnetomotive force coefficients of the medium's **recording** field for the thin-film head.
- CC B3120B Magnetic tapes, discs and recording heads; B3120N Magnetic thin film devices
- CT IRON ALLOYS; MAGNETIC HEADS; MAGNETIC **RECORDING**; MAGNETIC THIN FILM DEVICES; NICKEL ALLOYS; **RUTHENIUM ALLOYS**; SILICON ALLOYS
- SO IEEE Translation Journal on Magnetism in Japan (Sept. 1985) vol.TJM-J-1, no.6, p.738-40. 0 refs.  
Price: CCCC 0882-4959/85/0900-0738\$01.00  
CODEN: ITJER ISSN: 0882-4959  
Conference: 8th Annual Meeting of the Magnetism Society of Japan. Hiroshima, Japan, 13-15 Nov 1984
- L99 ANSWER 11 OF 11 INSPEC COPYRIGHT 2002 IEE
- TI Probe-type thin-film head for perpendicular **recording** using **multilayered** Fe-Si-Ru films.
- AB The coercivity dependence of read/write and noise characteristics are investigated for the probe-type thin-film head using **multilayered** Fe-Si-Ru films and Co-Cr/Co-Zr-Mo double-layer media. The D50 **recording** density of 100 kFCI (flux change per inch) and the output of 0.24  $\mu\text{Vpp}/\mu\text{m turn m/s}$  are obtained for the medium with the coercivity of 500 Oe. These characteristics are superior to those for conventional ring head (D50=80 kFCI,  $\text{Elk}=0.12 \mu\text{Vpp}/\mu\text{m turn m/s}$ ). Further, thin-film heads have low noise and high overwrite characteristics.
- CC B3120B Magnetic tapes, discs and recording heads; B3120N Magnetic thin film devices; C5320C Storage on moving magnetic media
- CT HARD DISCS; IRON ALLOYS; MAGNETIC HEADS; MAGNETIC **RECORDING**; MAGNETIC THIN FILM DEVICES; **RUTHENIUM ALLOYS**; SILICON ALLOYS
- SO Journal of Applied Physics (15 April 1985) vol.57, no.8, pt.2B, p.3961-3. 11 refs.  
Price: CCCC 0021-8979/85/013961-03\$02.40  
CODEN: JAPIAU ISSN: 0021-8979  
Conference: Proceedings of the Thirtieth Annual Conference on Magnetism and Magnetic Materials. San Diego, CA, USA, 27-30 Nov 1984  
Sponsor(s): AIP; IEEE

=> t L102 2,4-5,8-9 ti ab so

- L102 ANSWER 2 OF 9 METADEX COPYRIGHT 2002 CSA
- TI Magnetic and magneto-optical properties of CoPtM (R=rhenium, ruthenium) alloy films for a new magneto-optical recording material.
- AB CoPtM (M=Re, Ru) ternary alloy films have been investigated as new magneto-optical materials for blue laser recording. The CoPtRe and CoPtRu alloy films were prepared by sputtering without a heating process, and exhibited good perpendicular magnetic anisotropy and magnetic hysteresis loop squareness. For the magneto-optical properties, the figure of merit

for the CoPtRe alloy film with < 15 at% Re at  $\lambda < 530$  nm is shown to be superior to that for TbFeCo amorphous film and inferior 0-4 dB to that of Co/Pt multilayers.

SO Journal of Magnetism and Magnetic Materials (1 Jan. 1996) 152, (1-2), 243-252, Diffraction Patterns, Graphs, 13 ref.  
ISSN: 0304-8853

L102 ANSWER 4 OF 9 METADEX COPYRIGHT 2002 CSA

TI Information Storage Stamper and Method of Manufacturing Disks Using the Same.

AB Guide grooves are formed on a cemented carbide alloy disk or a cermet disk having been coated with either an Ir alloy film or a Ru alloy film by photography or ECR ion etching. The disk thus obtained is used as an optical or magnetic disk stamper. Next, a glass or Al disk is placed between a pair of stampers obtained as above and molded under pressure while heating thereby to make guide grooves of an optical or magnetic disk.

PI US 4953385 4 Sept. 1990

AD 22 Aug. 1989

L102 ANSWER 5 OF 9 METADEX COPYRIGHT 2002 CSA

TI Soft Magnetic Properties of FeRuGaSi Alloy Films: SOFMAX.

AB To advance new, soft magnetic materials of an FeGaSi alloy into the commercial world, improvements on various properties were designed by introducing additive elements without sacrificing its high saturation magnetic induction. The detailed studies on the diversified properties, such as saturation magnetic induction, film internal stress, wear resistivity, etc. were performed. High-frequency permeability of the laminated structure film was also investigated. As a result, the Ru-added FeRuGaSi alloy films, whose typical compositions are Fe<sub>72</sub>Ru<sub>4</sub>Ga<sub>7</sub>Si<sub>17</sub> and Fe<sub>68</sub>Ru<sub>8</sub>Ga<sub>7</sub>Si<sub>17</sub>(at.%), prove to be excellent soft magnetic materials, especially appropriate for the magnetic recording/playback head core use.  
20 ref.-AA

SO J. Appl. Phys. (15 July 1988) 64, (2), 772-779

ISSN: 0021-8979

L102 ANSWER 8 OF 9 METADEX COPYRIGHT 2002 CSA

TI Alloy Deposition.

AB See Met. A. , 8212-72-0586. A literature review is given on the deposition of Ni-Fe, Co-Ni, Ni-Cr, Fe-Co, Ni-Sn, Ni-Sn-Mo, Ni-Zn, Zn-Co-Cr, Sn-Cd, Ni-Mn, Cu-Ni, Fe-Cr-Ni, Cr-Co, Sb-Co, Ni-Mo, Ni-Co-W, Cu, Co-W, Co-W-P, Co-W-Mn, Co-W-V, Co-Mo, Ni-W, Ni-P, Co-P, Ni-Co-P, Ni-Sn-P, Co-B, Fe-B, Pd-Ni, Pb-Sn, Pb-Sn-Cu, Sn-Bi, Bi-Tl, Cu-Zn, Cu-Sn, Pb-In, Cd-Bi, Cr-Mo, Cd, Se, Ag-In, Ag-Sn, Ag-Sb, Bi-Pd, Pd-In and Ru-Ir alloy coatings and dispersion coatings. 148 ref.-P.A.H.

SO Jahrbuch Oberflächentechnik 1982, Band 38 .cents.Yearbook of Surface Technology 1982, Vol. 38!

Metall Verlag, Hubertusallee 18, 1000 Berlin 33. 1982. 104-116

L102 ANSWER 9 OF 9 METADEX COPYRIGHT 2002 CSA

TI Magnetic Recording Medium.

AB A magnetic recording medium of relatively magnetically isotropic thin metallic film on a support film comprises a metallic alloy of Co and either Re, Ru or Os or an admixture thereof.

PI US 4202932 13 May 1980

AD 16 Oct. 1978

L73 21 SEA ABB=ON PLU=ON L70 AND L40  
 L74 53 SEA ABB=ON PLU=ON L71 AND L40  
 L75 6 SEA ABB=ON PLU=ON L73 AND L30  
 L76 20 SEA ABB=ON PLU=ON L73 AND L29  
 L77 4 SEA ABB=ON PLU=ON L76 AND (L32 OR L36)  
 L78 53 SEA ABB=ON PLU=ON L74 AND L40  
 L79 24 SEA ABB=ON PLU=ON L78 AND L30  
 L80 2 SEA ABB=ON PLU=ON L79 AND (L32 OR L36)  
 L81 14 SEA ABB=ON PLU=ON L79 AND L31  
 L82 9 SEA ABB=ON PLU=ON L64 OR L72 \*\*\* >75% Ru  
 L83 23 SEA ABB=ON PLU=ON L65 OR L73 OR L77 NOT L82 \*\* >20% Ru  
 L84 43 SEA ABB=ON PLU=ON (L68 OR L80 OR L81) NOT L82 OR L83  
 L85 41 SEA ABB=ON PLU=ON L84 AND L29  
 L86 27 SEA ABB=ON PLU=ON L85 AND L30  
 L87 26 SEA ABB=ON PLU=ON L86 AND L31 \*\*\* (smaller amounts of Ru)  
 L88 1 S L82 AND (L37 OR L38)  
 L89 2 S L83 AND (L37 OR L38)  
 L90 2 S L87 AND (L37 OR L38)  
 L91 4 S L85 AND (L37 OR L38)  
 L92 13 S L66 AND (L37 OR L38)  
 L93 11 S L92 NOT (L88 OR L89 OR L90 OR L91) \*\*\*\* oxides/nitrides etc.  
 => d L82 cbib abs hitind hitrn

L82 ANSWER 1 OF 9 HCAPLUS COPYRIGHT 2002 ACS

2002:539347 Document No. 137:102832 Manufacture of magnetic recording media. Shimizu, Kenji; Sakai, Hiroshi (Showa Denko K. K., Japan). Jpn. Kokai Tokkyo Koho JP 2002203306 A2 20020719, 13 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-401139 20001228.

AB Magnetic recording media contain, on nonmagnetic substrates, laminates of at least soft magnetic base films, orientation adjustment films which adjust the orientation of films right above them, vertical magnetic films whose magnetization axis is vertically oriented regarding the substrates, and protective films. The orientation adjustment films comprise 1st layers having B2 structure and thickness of 0.1-20 nm, and 2nd layers having hcp structure and thickness of 0.1-50 nm. The magnetic recording media have excellent noise characteristic and experience little thermal fluctuation.

IC ICM G11B005-667

ICS G11B005-65; G11B005-738; G11B005-851; H01F010-08; H01F010-26; H01F041-14

CC 77-8 (Magnetic Phenomena)

ST magnetic recording media orientation adjustment film

IT Magnetic recording materials

Magnetization

(manuf. of magnetic recording media contg.

orientation adjustment films)

IT Magnetic films

(manuf. of magnetic recording media contg. orientation adjustment films and soft and hard magnetic films)

IT 7440-05-3, Palladium, uses 7440-18-8, Ruthenium, uses 7440-32-6, Titanium, uses 7440-48-4, Cobalt, uses 7440-67-7, Zirconium, uses 11134-20-6, Cobalt 84, samarium 16 (atomic) 11148-13-3, Iron 20, nickel 80 (atomic) 12707-14-1, Aluminum 50, iron 50 (atomic) 12780-63-1, Aluminum 50, nickel 50 (atomic) 57720-36-2, Chromium 45, cobalt 55 (atomic) 88873-10-3, Iron 85, zirconium 15 (atomic) 94470-26-5, Chromium 40, cobalt 60 (atomic) 94858-24-9 104193-19-3, Cobalt 89, niobium 7, zirconium 4 (atomic) 104675-01-6, Aluminum 55, nickel 45 (atomic) 136548-17-9, Aluminum 50, ruthenium 50 (atomic) 341037-16-9, Chromium 22, cobalt 64, platinum 12, tantalum 2 (atomic) 365403-57-2, Chromium 30, ruthenium 70 (atomic) 381243-05-6,

Nik, you can see Ru in this record 70 + 80 (next page)

09/816,548

09/13/2002

Boron 4, chromium 20, cobalt 62, platinum 14 (atomic) **434335-34-9**  
 , Ruthenium 80, titanium 20 (atomic) 441332-67-8, Aluminum 45, boron 10,  
 nickel 45 (atomic) 441332-68-9, Chromium 17, cobalt 61, platinum 22  
 (atomic) 442550-25-6, Cobalt 90, tantalum 4, zirconium 6 (atomic)  
 442550-26-7, Iron 75, nitrogen 10, tantalum 15 (atomic) 442550-27-8,  
 Chromium 35, cobalt 55, manganese 10 (atomic) 442550-28-9, Boron 5,  
 chromium 30, cobalt 60, tantalum 5 (atomic)  
 RL: DEV (Device component use); USES (Uses)

(manuf. of magnetic **recording** media contg. orientation  
 adjustment films, vertical magnetic films, soft magnetic films, and  
**nonmagnetic** intermediate films contg.)

IT 136548-17-9, Aluminum 50, ruthenium 50 (atomic)  
 365403-57-2, Chromium 30, ruthenium 70 (atomic)  
 434335-34-9, Ruthenium 80, titanium 20 (atomic)

RL: DEV (Device component use); USES (Uses)  
 (manuf. of magnetic **recording** media contg. orientation  
 adjustment films, vertical magnetic films, soft magnetic films, and  
**nonmagnetic** intermediate films contg.)

L82 ANSWER 2 OF 9 HCAPLUS COPYRIGHT 2002 ACS  
 2002:518104 Document No. 137:102827 Magnetic **recording** medium, its

manufacture, and magnetic **recording**/reproducing apparatus for  
 it. Shimizu, Kenji; Sakai, Hiroshi (Showa Denko K. K., Japan). Jpn.  
 Kokai Tokkyo Koho JP 2002197646 A2, 20020712, 14 pp. (Japanese). CODEN:  
 JKXXAF. APPLICATION: JP 2000-396074 20001226.

AB The **recording** medium comprises a **nonmagnetic** substrate  
 on which a soft magnetic undercoat layer, an orientation-controlling film,  
 a magnetic layer with axis of easy magnetization oriented perpendicular to  
 the substrate, and a protective film are formed. In the undercoat layer,  
 part or all of the surface facing to the orientation-controlling film is  
 oxidized, and the oxidized layer has thickness .gtoreq.0.1 and <3 nm. The  
 method for manufg. the **recording** medium involves a process for  
 oxidization of the undercoat layer. The app. using the **recording**  
 medium is also claimed. High-d. **recording** can be achieved by  
 using the **recording** medium.

IC ICM G11B005-738  
 CC ICS G11B005-65; G11B005-667; G11B005-851  
 ST 77-8 (Magnetic Phenomena)

high density magnetic **recording** medium oxidization undercoat  
 layer

IT Magnetic memory devices  
**Magnetic recording materials**  
 Oxidation

(**magnetic recording** medium with surface-oxidized  
 soft magnetic undercoat layer for high-d. **recording**  
 /reproducing)

IT Gadolinium alloy, base  
 Hafnium alloy, base  
 Rhenium alloy, base  
 Terbium alloy, base  
 Yttrium alloy, base

RL: DEV (Device component use); PEP (Physical, engineering or chemical  
 process); PYP (Physical process); TEM (Technical or engineered material  
 use); PROC (Process); USES (Uses)

(orientation-controlling layer; magnetic **recording** medium  
 with surface-oxidized soft magnetic undercoat layer for high-d.  
**recording**/reproducing)

IT 7440-05-3, Palladium, processes

RL: DEV (Device component use); PEP (Physical, engineering or chemical

305-0179